Department of Employment and Productivity

The Training and Use of OPERATORS as INSTRUCTORS

Report of a Departmental Committee on the training of operator-instructors

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The Committee has tried to make this Report as comprehensive as possible, but many readers will not have the time, opportunity or need to digest the whole of its contents. The following suggestions on how to make the best use of the Report according to specific interests may be helpful.

1 If you just want to know what this Report is about —

Read the Summary on page vii

2 If you have limited time and need to know more about the contents and the conclusions —

Read the Summary and the Conclusions on pages 25-28

3 If you are a Manager, wishing to know how to introduce a scheme of "on-the-job" training using "operator-instructors" —

Read the Summary, the Conclusions, and pages 13-24 in detail

4 If you are a member of management responsible for training, a training officer, or a teacher in a Technical College responsible for the training of operator-instructors —

Read the whole of this Report

Foreword

Facilities for the training of instructors have been provided for many years by the Department of Employment and Productivity, both at the Department's Instructor Training Colleges at Letchworth and Glasgow (Hillington) and also through its Training Within Industry (T.W.I.) Services.

There has been a substantial increase in the demand for this form of training following the passing of the Industrial Training Act 1964 and the creation of industrial training boards. The Department has extended facilities for the training of full-time instructors and introduced a new Training Development Service for the specific purpose of training on-the-job instructors within industry. Many of these instructors are experienced operators who have been selected either for full-time or part-time instruction on the job.

Towards the end of 1966, a Departmental Committee was appointed to review the progress being made in the provision of instructor courses generally, and to make recommendations on the content and methods of instruction applicable to the training of experienced operators in industry who would be used as full-time or part-time instructors on the job. Representatives of a number of training boards and of the Industrial Training Service were invited to join the Committee to ensure that wide experience was available.

In the meantime, the demand for this form of training has continued to grow, and industrial training boards have been placing increasing emphasis on the need to improve the quality of on-the-job instruction as an essential part of the whole training process, even in cases where some of the training is being done effectively off the job.

Although the Committee was primarily concerned to advise the Department of its own services to industry, it has been decided to publish that part of the report which has particular relevance to the successful application and administration of on-the-job instruction. It is hoped that the report will be of particular interest not only to industrial training boards and those engaged in providing this service but also to managers and supervisors generally in industry who carry a personal responsibility for the success of any on-the-job training scheme.

Contents

Page

Foreword iv

Terms of reference vi

Committee membership vi

Summary vii

Introduction viii

Assessment of need and survey of existing courses

Assessment of need 1

Survey of existing courses 2

The operator-instructor training course .

The aim, content and methods of instruction . . 6

Examples of courses . . 10

Introducing and maintaining an "on-the-job" training scheme using operator-instructors . . . . .

The basic requirements 13

Instructions to managers and supervisors . . . 15

The selection of operator-instructors . . . 16

Some examples of applications 18

Conclusions 25

List of Appendices 29

Appendices 30-69

Departmental Committee on the Training and Use of Operators as Instructors

Terms of Reference

"To examine existing provisions for the training of instructors (with particular reference to instructors engaged in training of operatives on the shop floor) . . . to make recommendations on the form and content of a basic course, or courses, most suitable for the training of "on-the-job" instructors."

Membership of the Departmental Committee

F. H. Perkins, O.B.E.	Chief Adviser on Industrial Training (Chairman)
P. McC. Boyd, M.B.E., M.C.	Training Division, Branch B
Miss A. Roberts	Training Division, Branch D
A. Bennett, O.B.E.	Training Division, Branch E
C. Fee	Training Division, Branch E
J. Moon	Engineering Industry Training Board
O. F. Atkins	Iron and Steel Industry Training Board
A. T. Dunn	Wool, Jute and Flax Industry Training Board
A. R. L. Griffiths	Industrial Training Service
R. M. McCarthy	Training Division, Branch E. (Secretary)

The members of the industrial training boards and the Industrial Training Service were invited to join the Committee so that their advice, as members of the permanent staff of their own organisations with experience in the field of instructor training, might be available.

Summary

The Committee has examined the problems of "on-the-job" training in industry, and considered how this training can be most effectively organised, both as a separate activity and in conjunction with "off-the-job" training.

After reviewing the courses and methods already in existence for the training of full-time instructors, the Committee went on to the study of systems of "on-the-job" training employing experienced workers as part-time instructors. During the Committee's deliberations, it became increasingly clear that this is the method most generally employed, particularly in the operator field and among the large number of small firms which, for one reason or another, are unable to take part in group schemes or to employ their own training specialists.

In the course of the study, the Committee became convinced that well organised systems of "on-the-job" training employing operator-instructors could not only bring about a substantial improvement in the effectiveness of training, but that they had as good a claim to recognition and encouragement by industrial training boards as other forms of training.

In preparing recommendations for such systems, and for the necessary training of operator-instructors, the Committee studied a variety of courses and methods already in existence for the training of staff in the techniques of instruction. Details of such courses, some of which are primarily concerned with the training of full-time craft and operator-instructors, are given in this report.

The main recommendations indicate the modifications that are required in the courses originally designed for full-time instructors to meet the special needs of the part-time operator-instructor. Emphasis is given to the fact that any system employing such instructors will be of practical value only if it forms part of a well-planned and organised scheme within each firm, in which managers and supervisors are fully involved and accept their responsibilities for effective operation.

The Committee recognises that in this field of training many firms, particularly the smaller ones, will have to rely on the services of outside agencies, including industrial training boards, the Industrial Training Service, the Department of Employment and Productivity's training service and other agencies. Although some detail is given on the services available, no recommendations are made about the most appropriate service to use because the conditions of training vary so widely. But it is hoped that the general lines of guidance given in this report will not only be of interest to all such agencies, but that they will stimulate the growth of the services they provide on the lines that the report suggests.

Introduction

Since the Industrial Training Act was passed in 1964 there have been great developments in the instruction of all levels of employees in courses away from their work. When it is possible to separate training entirely from production it can be better organised and the trainees usually make better progress, especially during the initial training periods. But there are many cases in which this "off-the-job" training is not possible, and there will always be a need for training "on-the-job" which needs to be planned just as carefully.

The immediate responsibility for what happens at the workplace rests, of course, with the supervisor on the spot who must ensure that his workers are properly trained. But he has other jobs to do as well, so he will generally have to use skilled operatives as instructors. Experience in many industries has shown that when adequately prepared for their duties these instructors can transmit their skills very effectively either to new entrants or to those who need the final stages of preparation after more formal training "off-the-job". They can be employed on instructional duties either full-time or part-time, according to training needs.

The Committee has conducted its inquiries in the hope of providing advice for those concerned with the organisation of training, the provision of facilities and the training of instructors. Special attention has been given to the training of the part-time operator-instructor, but most of the conclusions reached will apply equally to the full-timer.

For many years the Department has provided courses for supervisors (Training Within Industry Scheme) and also for instructors, the latter at its training centres at Letchworth and Hillington. Some experienced operators have attended the instructors' courses, but they have mostly been potential full-time craft and other instructors, who will be working "off-the-job". More recently the Department's Training Development Service has introduced a course designed to produce operator-instructors for work "on-the-job". The course is held on the premises of employing firms, and it includes advice and guidance for managers and supervisors on the effective use of the operator-instructors.

Before formulating its own recommendations the Committee decided to examine all known facilities available to industry for producing operator-instructors, and to study the methods of preparation which have proved most effective. The results of this examination are included in the first part of this report. They are followed by suggestions and recommendations based on the practical experience of members of the Committee. At all stages it has been borne in mind that however important the work of the instructors may be, it must be part of a carefully devised training plan in which all levels of management and supervision recognise the part they have to play.

The main purpose of the report is to provide guidance to the Department in the development of its own training service to industry. It is hoped, however, that it will help others concerned in assisting firms with the development of "on-the-job" training methods. It is not, of course, intended to lay down any standard patterns, and there will be many reasons for variation. But the report should stimulate the use of training programmes for more effective "on-the-job" training. It is also hoped that those smaller firms which find "off-the-job" training impossible, will discover in the report material which will help them to give systematic training "on-the-job" with their own instructors.

The terms "operator" and "operative" are widely but not very systematically used in industry. For the purpose of this report no attempt is made to distinguish between them, but the term operator has been chosen in the title of the "operator-instructor". He may be tentatively defined as:

> ***An operator or operative who normally works at a specific task or operates a particular machine or group of machines, but who may be required from time to time to pass on his skill or knowledge to a trainee or other worker who may be assigned to work with and learn from him.***

This definition is not complete for all purposes but it should be sufficient. It should be read to include women operators or trainees as well as men.

Assessment of need and Survey of Existing Courses

Assessment of need

The "operator-instructor" as defined in the Introduction is mainly concerned with process (non-craft) occupations and he still provides by far the greater part of the training in such occupations, working under the supervisors who are responsible for the workplace activities. It is obvious therefore that there are a vast number of experienced workers acting in some way as part-time instructors. Very few of them have been taught how to instruct, and only recently has the need for helping them become recognised. The first need therefore is to convince managers and supervisors that an effective scheme of operator-instructor training will produce better trained workpeople, better production, and greater job satisfaction.

Needs can therefore be identified as follows:

(*a*) Adoption by the firm of an organised system of training on-the-job properly related to other training activities.

(*b*) Acceptance of the system by management and its integration into normal production and control procedure.

(*c*) Full understanding by each manager or supervisor of his own duties in working the system.

(*d*) Preparation of the firm's own training officers or other managers responsible for training. They must be able to plan and introduce the system and to control the training given by the operator-instructors.

(*e*) Selection of an adequate number of experienced operators to become operator-instructors.

(*f*) Actual training of experienced operators in the skill of instruction.

These are the essentials of any overall plan; and when such a plan is referred to later in the report the essentials are implied. Plans of this kind could apply to the office as well as the shop floor. If they were widely established in industry the effects would be impressive.

Before making recommendations for the future it seemed to the Committee that some attempt should be made to assess the number of operator-instructors who should be trained. Even if all managements were immediately co-operative there would be difficulties in arriving at figures. The ratio of the number of operatives to the number of craftsmen varies widely. It may be as low as 3 : 2 in engineering or as high as 3 : 1 in the chemical industry. The Department's statistics indicate that in all industries the number of semi-skilled* workers is about equal to the number of skilled.

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* As defined in Part C of the Department of Employment and Productivity's Occupational Analysis.

In determining the proportion of those in semi-skilled occupations who might be under training for any period in any one year, it is necessary to take into account losses due to retirement, death, etc., and also those due to change of employment. From the evidence available it is reasonable to assume that at least 15% of those employed in such occupations will be receiving some form of training for a limited period of time in any one year.

The number of operator-instructors required will depend on the length of the training periods and on the number of trainees that may be assigned to any one instructor. In some cases the ratio may be as high as 1 : 1 if instructor and trainee are operating together in the same work place. In other situations the ratio may be as low as 1 : 4 or 1 : 5. Training periods may also vary widely from a few days to many weeks or months. Using the basis of an average 4-week training period, a 1 : 2 instructor-trainee ratio, and 15% of the total operator work force under training, the requirement of operator-instructors might be of the order of one to every 100-150 operatives. In this connection it is interesting to note that in the wool industry, which employs some 175,000 workers, the Training Board has estimated that the industry will require about 2,000 full-time operator-instructors, if on-the-job training is to be made fully effective.

Clearly no scheme will make any significant contribution in meeting a need of this magnitude unless the following conditions are satisfied:

(*a*) Management is convinced of the tangible results that can be achieved

(*b*) It can be introduced and operated with the minimum interruption to production and without undue demands being made on managers and supervisors

(*c*) the scheme is suitable for recognition under the grant regulation of the appropriate industrial training board.

All these figures have been borne in mind in making the recommendations contained in the later part of this report.

Survey of existing courses

Before formulating its recommendations, the Committee decided to make a general survey of a number of existing courses designed to develop skill in job instruction. It did not confine its survey to courses solely aimed at the training of experienced operatives, as it wished to consider any existing practice that might influence its recommendations.

It was not possible to cover all courses which include a job instruction element, but a selection was made and visits were paid by individual members of the Committee to representative courses which are known to include this training element.

The courses selected for study and visits were as follows:

The D.E.P. Training Development Service for operator-instructors *(Appendix 1)*

This service has been devised to meet the specific need for training as operator-instructors of selected operators who will from time to time be called upon to train other workers on the job. It is essentially in-plant training in which either a firm's trainer (who has been trained to present the course) or the Department's own training staff train operator-instructors within the firm.

The course is designed to train six operators as instructors in four days (or eight operators in five days) and is preceded by separate sessions for managers and supervisors (normally given at least one week before) on how to organise and supervise the scheme.

The service has already been successfully utilised by such widely diversified industries as motor manufacture, brushmaking, steel production, rolling mills, soft drinks and optical instrument making.

The D.E.P. Instructional Techniques course for industrial instructors *(Appendix 2)*

This two week course was introduced in 1940 at the Letchworth Instructor Training College for the purpose of training the Department's own instructors for service in Government Training Centres. The course was made available a few years later to instructors from industry, and recently, the majority of those attending have been sent by individual firms on a fee paying basis.

The increasing demand from industry led to the establishment of a second College at Glasgow (Hillington) in 1963 as well as expansion of the Letchworth capacity. In addition, during 1967/8 Instructor Training Units have been set up in the Government Training Centres at Perivale (Middlesex), Cardiff, Liverpool, Killingworth (Northumberland) and Leicester, each with 16 training places. A total capacity of some 250 training places is at present available, providing for an output of over 3,500 instructors a year.

The course is primarily designed for the training of full time craft instructors employed in training centres in which a fair range of training facilities (including class instruction with the appropriate audio-visual aid equipment) is available.

The demand for places has trebled in the last four years, mainly as a result of the Industrial Training Act, as nearly all boards accept these courses for grant purposes. One of the main problems has been to find sufficient qualified lecturers; however, additional lecturers are in course of being trained.

A variation of this course (*Appendix* 3), extended to three weeks, is provided at Letchworth for craft and process instructors in the iron and steel industry. The syllabus of the standard two week course is modified to include more practical periods on work with which the instructors will be concerned in their own industry.

The D.E.P. Modified Instructional Techniques course for industrial instructors *(Appendix 4)*

This is a one week course (a condensed version of the course above), provided by the Department's own training staff for firms which are expanding in Development Areas. The courses are held on firms' premises for groups of six or eight employees whom their employers wish to use as instructors but cannot release for outside training.

So far, firms in the Development Areas have made surprisingly little use of this service.

Industrial Training Board courses *(Appendix 5)*

The Wool, Jute and Flax Industry Training Board has organised during the last four years a series of two week courses for instructors in the wool industry.

The courses have been held in various centres in the West Riding, the West Country and Scotland, and some 1,932* instructors have attended. Since September 1966, because of growing demand, the responsibility for providing them has been transferred to a number of selected technical colleges. Before a course begins the college staff, who will conduct it, attend a one-week briefing organised by the Board to establish content and standards. Then the supervisors of those nominated to attend have a half day appreciation course at which they learn about the purpose and methods of instructor training and about the system of operator training in the factory. When the course members return to their job they are shortly visited by members of the Board's advisory staff, and if they are providing efficient instruction they are given certificates of proficiency.

The Electricity Supply Industry Training Board have prepared syllabuses for the training of instructors which compare in broad outline with the two week course provided by the Department at its Letchworth Training College. The courses are primarily concerned with the training of full-time craft instructors, operating in off-the-job training centres, and attention is now being given to the preparation of courses for on-the-job instructors. Other boards have already initiated courses of their own for the training of instructors or are in the early stages of preparing such courses.

The Industrial Training Service *(Appendix 6)*

This Service, which has regional offices in main industrial centres in the United Kingdom, provides assistance on training of all kinds to industrial training boards, employers' organisations and individual firms. The training of instructors forms an important part of the Service's work and in 1966/67 some 55 courses were held for more than 700 full-time and part-time instructors. The duration, content and method varies according to requirement.

In addition, the Service provided three general courses each year in practical training techniques. These courses, which were normally held in hotels, provided two separate weeks of instruction interspersed with a short period of practical experience in the instructor's own workplace. Courses of this character are now provided as required to meet the needs of specific companies and organisations.

Technical Colleges

An increasing number of technical colleges are providing short courses for the training of instructors. The length of the courses corresponds closely with those provided by other organisations. Some have been specially tailored for the needs of particular industries, and the trend is in the direction of the sandwich type course in which the intervening period is used for visits by the college staff to individual instructors in their own work place. During these visits, special attention is paid to the analysis of jobs with which each instructor is directly concerned.

The Armed Forces

Instructor training has always been strongly featured in the training schemes of all arms of the Services, and there is no doubt that industry has much to learn from their experience. It has not been possible to study all types of Service instructor training, but the Committee were able to obtain full details of the Royal Air Force programmes.

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* 31st March, 1968.

These are broadly sub-divided into four types of course:

1 Management of Training Activity
2 Supervision of Training Activity
3 Ground Instructors' Training Course (Centre Type)
4 Instructional Techniques Course (Trades).

The first two courses lasting approximately 5 days are for commissioned and warrant officers. They deal with administration and instructional techniques, and resemble the courses provided by industry for managers, supervisors and others with responsibility for training schemes. A written examination is held.

The third course of two weeks caters for the full-time instructor who is normally employed in a training centre. The fourth course of three weeks' duration, provided for instructors of all trades in Technical Training Command, is of particular interest, as its objectives correspond most closely with those the Committee has in mind for the training of operator-instructors. In this course the amount of time devoted to practical activity is increased to 70%, and even the remaining 30% consists of demonstration lessons in a workshop setting. Although the use of teaching aids is referred to, it does not occupy much of the time. No written examination is used, but the general capacity of instructors is assessed.

The Textile Council

The Council's Productivity Centre has provided courses for instructors for over twenty years. By experiment and research into training methods, the Centre has developed a unique scheme for making the most effective use of selected mill operators as instructors.

The original training was based on the T.W.I. Job Instruction technique but in the course of time it was found necessary to introduce an advisory service to assist individual managements in the organisation of training, in the setting up of training facilities, the selection and training of suitable operatives as instructors and their subsequent coaching, to ensure effective results. The T.W.I. 'breakdown' technique was developed into a more thorough analysis of skill, and simulated timed exercises were introduced.

The Centre has developed a range of specific 7-day programmes (Systematic Operative Training – S.O.T.) for individual occupations such as spinning, winding, finishing, cardroom, weaving and cloth inspection. These programmes are followed up by a further 3 days of coaching and advice on the job.

Realising the importance of the management role in any successful training scheme, the Centre provides a one day course for management on the planning and supervision of training, together with information about the techniques that are used.

The operator-instructor training course

The first of the training needs which were established on page 1 is the adoption by the firm of an overall plan in which management and supervisors are fully involved. The survey of existing courses has confirmed the Committee in its view that no course which is not part of such a plan can achieve satisfactory results. More will be said about the role of managers and supervisors in pages 13–17 of this report; in the meantime all the Committee's comments and recommendations about training are based on the assumption that there *is* an overall plan and that everyone concerned knows what it is.

The aim of the courses for training operator-instructors

The aim is to provide the course member with sufficient

- (*a*) knowledge of the techniques of instruction;
- (*b*) skill in applying these techniques in teaching the learner his job. The skill will come from experience and practice of his new knowledge;
- (*c*) confidence and satisfaction – resulting from understanding his role in the overall scheme, and from assurance that further coaching and guidance will be available when necessary.

He should then be equipped to train newcomers to the job so that they work competently (i.e. to the required standard), safely, and with reasonable speed.

In designing a course with these aims, much will depend on the nature of the work in which the operators are engaged, and the general level of intelligence and abilities they possess. Although, for this reason, considerable latitude must be allowed to the course organiser, there are certain general lines of guidance that can be given on the structure and content of the course and the methods of instruction.

In comparison with courses designed for full time centre-based instructors, to which reference has already been made (pages 3–5), the operator-instructor has a more specific and at the same time a more limited role to perform. In an instructional sense, he does not require to be so versatile, and he is likely to be more circumscribed in the training facilities available to him. He will not normally be required to give any theoretical explanations or to deal with any technological aspects of the job. He is essentially a practical man doing a practical job.

Structure and duration

The course, therefore, should contain a *minimum* of theory and a *maximum* of practice. Any theory needs to be illustrated as far as possible by demonstration and visual presentation.

Whatever the length of the course, experience has shown that the best results will be obtained on the basis of the following allocation of time:

(*a*)	background information and talks on theory and technique of instruction	25%
(*b*)	practical demonstrations and individual exercises in the meeting room	25%
(*c*)	practice on the shop floor or in the office	50%

The actual arrangement of the training will depend on circumstances. After studying existing courses the Committee came to the conclusion that in many cases a course of about ten working days is essential. The ten days may be continuous with practical work on the job woven into the course; or there may be two separate weeks with an intervening period during which course members can undertake practical exercises at their own workplaces, with coaching and appropriate supervision. This latter arrangement becomes necessary when the course is held some distance away from the member's workplace. There are extreme cases in which it may be impracticable for an experienced operative to leave his job for more than a few hours at a time, and the structure of the course, probably more extended in overall time, will need to be arranged to suit such circumstances. In such cases, it becomes imperative that the off-the-job part is arranged as close to the workplace as possible.

The Committee recognised, however, that in particularly favourable circumstances, in which an overall training plan is well established, job analyses already exist, and working methods are standardised, an experienced operative can be trained in the basic elements of good instruction in a period of five days or less.

One extremely effective application was inspected in which off-the-job training of the selected operators had been reduced to twelve hours. This had been made possible by the existence of a well established and fully integrated training scheme, involving all levels of supervision, in which the operator's own supervisor was able to give the necessary subsequent coaching and expert guidance on-the-job.

Whatever the length of the course and its arrangement, the practical periods need the closest possible association with the theoretical instruction and the teaching of the techniques. Trainees must be able to participate individually in the practical demonstrations given to the group; they must also have the opportunity of translating what they are learning into practical application in their own workplace. Easy access to the workplace is therefore highly desirable, but where this is not possible, the intervening periods must be carefully organised under expert supervision to provide this opportunity.

The Department's Training Development Service for operator-instructors, organised within the firm, provides an opportunity for on-the-job practice to be interwoven into the course as and when required. In other circumstances, the Wool, Jute and Flax Industry Training Board has introduced a three-day on-the-job project in the second week of the course. The Textile Council's Productivity Centre provides three separate days of follow-up of application on the job following a seven day course. Experience has shown that preference should be given to practical application on the job whenever it is possible to extend the length of the training period. Any course organised for operator-instructors away from the job, which does not include an organised and supervised period of practical application on the job as part of the training, is likely to have very limited results.

Size of group

The need for adequate individual participation in the course, and individual tutoring of practical periods on the job, sets a limit to the size of the group, and it is recommended that the minimum should be six and the maximum eight. In some cases the trainees will be able to work in pairs in the practical periods, and in the case of the larger group this arrangement makes coaching and supervision easier. It must not be overlooked, however, that skill in instructing can best be developed by individual practice rather than by group participation.

Location and provision of facilities in the meeting room

The group meeting place should be as accessible to the trainees' own workplaces as possible. The members should meet in the usual form of "round table" discussion group, and the room must be isolated from noise, telephone and other distractions. A chalk board is essential, and other audio–visual aids can be helpful. It must be remembered, however, that the aids that may be useful for instruction in the meeting room will not necessarily be available to the operator-instructor on the job. There are, however, various kinds of aids such as models, illustrative samples, drawings and diagrams, examples of faulty work, etc., which, with ingenuity and imagination, can be used on the job. Examples of these and explanation of their use must form an integral part of the instruction in technique available in the meeting room.

Content of the course, and method of instructing

Especially in the early sessions of these courses it is important to establish easy relationships and a clear understanding of what it is all about. Anything which might cause anxiety should be avoided. If members do not already know each other, informal self-introductions (including that of the tutor) and a question about training and about the course objectives will help to set the tone. It is always helpful if those joining a course have received before attendance a short verbal or written introduction to the course. If this can be done by the operator's own supervisor from his personal knowledge of the course, much time and effort can be saved in the meeting room. If the firm's senior training officer or a member of management can say a few words at the outset, making plain the firm's own belief in the importance of the training, this can also help to get the course off to a good start. Unless easy relationships and clear, simple objectives are established during the initial sessions, much of the value of the subsequent training will be lost.

The course tutor will need to know:

(*a*) what has already been imparted to new learners in any induction training they have received;

(*b*) the nature of the job or work situation in which each member of his course is engaged;

(*c*) the amount and kind of expert help each member can rely upon when back on the job and engaged in the instruction of a new learner;

(*d*) how far jobs have already been analysed and work methods standardised, and what information of this kind will be available to the operator-instructor in the workplace.

If the course tutor shows that he fully understands the existing state of affairs, he will save time, and his training can be tailored to meet the immediate needs of his group.

The technique of instruction then needs to be presented by a well balanced process of instruction, demonstration and discussion. The subject matter must be in the simplest terms, and it is probably inadvisable to dwell on theoretical learning concepts. The more what is said can be in terms of the jobs with which the members are acquainted, the more effective training will be.

Basically, the initial treatment must emphasise the need:

(*a*) for agreement on the best method of doing the job, whatever an operator's past experience may have been;

(*b*) for an analysis (or breakdown) of operations in doing the job;

(*c*) for the identification of the knowledge and skill required in each step or stage of the job.

Special care must be taken to see that experienced workers accustomed to methods of their own are conditioned to accept the idea that there is always "a better way", which they must be prepared to follow if they are to be successful instructors of others.

Even if standard job analyses or breakdowns are available and have to be followed, individual members should learn to make a breakdown themselves. It is only in this way that the knowledge and skill required in each stage of the work can be assessed and taught. However experienced an operator may be, he will not fully appreciate the critical points of difficulty for the learner until he has, in fact, made the analysis himself. It is therefore essential that, in the first part of the course, the instruction should concentrate on the understanding and practice of the "analysis" technique, with an ample supply of simple exercises on which the trainees can practise individually. Unless this part of the course is thoroughly covered, the end result may be disappointing.

The analysis is usually made on a job-breakdown sheet, which identifies the successive stages of the job with the essential key points (knacks, tips and know-how that make the job easier to do) set down alongside each stage. A simple breakdown of this kind is all that is required for a vast number of jobs, and the ability to make it should be well within the capacity of carefully selected operator-instructors.

For more complex or composite skills, a more sophisticated form of analysis may be required, and the technique may be beyond the capacity of operator-instructors. It will be the responsibility of the course tutor, in conjunction with the shop supervisors, to identify jobs of this character, and to ensure that if the analyses are not already in existence, the necessary specialist assistance is made available.

As soon as the trainees can perform the simple breakdown, the course tutor can proceed with the basic technique of good instruction, by means of which the operator-instructor imparts what he knows to the learner. This part of the syllabus will span the theoretical and practical aspects of the whole course.

The trainees need to acquire a familiarity with the technique by individual practice in the meeting room, and a liberal allowance of time must be made for this purpose. It is at this stage that the trainees become aware of the learning difficulties of those whom they will be instructing. Background information is given about the way in which the operator-instructor can assess the needs of individuals, and about the influence that such an assessment will have on the instructional technique he uses.

The aim of the tutor must be to ensure that each course member develops a skill:

(*a*) in choosing the most effective learning sequence;

(*b*) in determining the size of each step of instruction, and making clear its purpose to his learner; and

(*c*) assessing the most effective rate at which the learner can progress.

The amount of theory which is included should be just sufficient to explain why the recommended methods have been chosen. At least two-thirds of the practical demonstrations and exercises should be designed to produce individual skill in instructing.

Under normal circumstances, a short course, skilfully planned with talks, demonstrations, discussion and practical exercises covering the foregoing syllabus should achieve the main objectives already stated. With additional coaching on the job as required, the experienced operator should then be able to take on his instructional duties with competence and confidence. Much can be said in support of restricting the content of the course to the minimum that will ensure good and lasting results. Nevertheless there may be special circumstances in which other items should be included, which may help the operator-instructor to appreciate more fully the importance of his role as an instructor, and the way in which his work fits into the overall training plan. He may for instance be given information about the firm's programme, about the part in it which has been assigned to his immediate superiors, and about the compilation and custody of training records. If prescribed learning times are to be applied to his work he should know about them and agree with them. He may need to know about the production times and pay system which will apply to his learners when they are proficient. The effect of a training assignment on his own earnings will obviously be of great interest; and he should be given the opportunity to meet others, perhaps more experienced, who are already serving as operator-instructors.

Examples of Courses

With the objectives, content and instructional method outlined above in mind, the Committee has drawn up the syllabuses and timetables for four types of courses.

For two of the courses it chose a 2-week period as likely to be the most generally applicable; one course is for in-plant use and the other for use in a location where easy access to the workplace of trainees is not possible.

For the other two courses, a 1-week period was chosen, for circumstances in which an overall training plan is in full operation, job analyses are well established, and supervision is well qualified to give continuing coaching after the course. As in the case of the two-week courses, one has been designed for use within the plant, with the trainees' workplaces easily accessible, and the other for use when the course is held away from the plant.

A 2-week course (in-plant) *(Appendix 7)*

This course, which has many similarities with the Department's Training Development Service Course (*Appendix* 1), is designed for in-plant use and can be conducted by a firm's own training officer, by the training staff of the Department, or by any other person who has received the necessary preparation.

It assumes that the group size will not be more than eight, and that those attending will be expected to make the analyses (breakdowns) of their own jobs for instructional purposes, and to develop their own skill in instructing with limited follow-up coaching from specialists.

A 2-week course (out-of-plant) *(Appendix 8)*

As this course for 6 to 8 members has been designed for use away from the plant, possibly in a technical college or an outside training location, the group work has been concentrated in the first six days of the course. It is assumed that a workshop as well as the meeting room is available, and a substantial proportion of the six days is in fact spent in the workshop on practical exercises. A sample list of the practical exercises that might be used in the workshop is given in *Appendix* 8. The interweaving of practical periods in the manner indicated is valuable but, even so, a further four days are allocated at the end of the course for coaching by the course tutor of individual members in their own workplaces.

Where no workshop facilities of this kind are available, a possible variation would be the division of the programme into two parts, with an intervening period of coaching on the job as arranged in the Industrial Training Service course (*Appendix* 6). The actual point of division needs careful consideration, because the optimum value to be obtained from the intervening coaching period will depend on the amount of skill which individual members of the group have acquired in the technique of analysis before returning to their workplaces.

In cases where the course is held away from the plant, for instance in a technical college or a DEP centre, the course will probably be conducted by an external tutor. In such a case, it is essential that the tutor has the closest possible liaison with the firms represented on the course. It is desirable that he should be involved in the selection of the potential operator-instructors, and that he should be conversant with the actual work in which they will be concerned as 'instructors'. He should also be responsible for discussions with the firms' managers on the overall training plan, and be able to do the necessary coaching on the job. As stressed on pages 13-16, it is essential that this training is fully supported by managers and supervisors who understand their part in the overall training plan, and who will be able to provide the further guidance and help necessary to make the training effective.

Both the above courses are suitable for general use in most industries.

A 6-day course (in-plant) *(Appendix 9)*

This course has been designed mainly for operator-instructors who are required to give instruction on a production line or track in which a wide variety of jobs of limited skill have to be done to a time schedule. In such cases, it is assumed that work methods and job analyses have previously been studied and determined, and that the main objective is to improve the quality of instruction that is given.

Again the course should be limited to not more than 8 members, and it should be conducted wherever possible by the firm's own training officer Subsequent coaching by a competent supervisor is of paramount importance.

A 5-day course (out-of-plant) *(Appendix 10)*

The work is planned on refresher course lines, the main objective being to develop analytical and instructional skills. It is assumed that the members are drawn from a variety of firms, and that it is not possible to tie the course into any one firm's particular work and practices. The timetable (*Appendix* 10) gives a broad indication of the division of time between job analysis and development of instructional skill.

Any course of this short duration and character can only be effective if the firms represented on the course have organised systems of training and competent permanent staff available for coaching and subsequent supervision.

There are many other possible variants of the above courses which could be devised to suit a particular industry's or firm's own circumstances. Nevertheless, it is the Committee's view that on courses of one or two weeks duration the following analysis of content, and approximate time allocation, can be used as a general guide.

Syllabus

Introduction, background information. The purpose, objectives and plan of the course. Demonstration of the complete method.	10%
Demonstration and discussion of job analysis.	7%
Individual practice of job analysis and identification of knowledge and skill content.	35%
Standards of work, fault analysis, etc.	3%
Practice of instruction based on analysis	30%
Practice on-the-job with coaching.	15%

Some examples are given on pages 18-24 of ways in which training courses for operator-instructors can be integrated into the production procedures of a firm, so that managers and supervisors accept full responsibility for the continuous and systematic operation of the scheme.

Introducing and maintaining an on-the-job training scheme using operator-instructors

The basic requirements

The role of managers and supervisors in making operator training effective has already been emphasised in this report. Behind the operator-instructor and and his trainee there must be effective organisation and administration. It must provide for

- (*a*) selection of those to be trained;
- (*b*) definition of jobs and of required standards of performance;
- (*c*) allocation of learners to instructors;
- (*d*) organisation of facilities, e.g. provision of suitable work for trainees, allocation of machines, etc.
- (*e*) definition of training methods to be adopted;
- (*f*) training operator-instructors to analyse jobs, and to break them down into instructional units, with the assistance of specialists when necessary;
- (*g*) maintenance of records;
- (*h*) regular assessment of trainees' progress to ensure that the training remains effective.

As mentioned on page 2, managers and supervisors may have difficulty in supporting a training scheme if it makes undue demands on their time and attention. It is therefore of paramount importance that arrangements should be as simple and practical as possible, with minimum disturbance of production schedules. The practical results, however, should be apparent to all. Nothing is so frustrating as a cumbersome operation showing little in the form of practical results.

The Committee has been impressed by the success achieved by some firms, in which managers and supervisors have become personally committed to a practical plan, in the initiation of which they themselves have taken part. Successful planning of this character is only possible when managers and supervisors know what training is necessary, and what techniques are used, so that they can supervise its practical application without undue strain.

Successful schemes make heavy demands on the specialist training staff and the training facilities they are able to offer. When staff and facilities are closely geared to the particular requirements of the job, smooth-running is ensured and beneficial results can be achieved on a lasting basis.

The part which management have to play and the timing of their actions will depend on the particular circumstances. On the establishment of a new plant, a training plan will be needed as part of the operational procedures. There is probably no better opportunity of demonstrating the value of effective training than in the start-up of a new plant or machine. If the training plan is properly timed, valuable savings will accrue in bringing the plant or machine into production and up to trouble-free capacity output. With plants of high capital value, these savings can be vital. It invariably occurs that, in situations of this kind, the operator-instructor has a vital role to play; but what he is able to do is determined by the steps which management and supervisors have foreseen and provided for.

In other situations where production processes are already well established, the responsibility of management is to maintain an organisation that is regularly adjusted to keep the training activity running efficiently. In such cases, the company's policy and overall plan will be well known and understood by all concerned. Supervisors will have previously attended courses at which the plan has been discussed and the techniques have been explained and demonstrated. Some supervisors may have previously served as operator-instructors and will fully appreciate their roles in relation to the work of their successors.

Even in the most efficient organisations, with well established practices, it will always be the duty of management to keep the working of the training plan under constant review. The regular meeting of operational staff which any manager may hold should have the working of the training plan as a normal item on the agenda. The kind of questions that may arise may be as follows:

(*a*) Have new supervisors been told about the plan and the part they have to play in it?

(*b*) What is the forward training requirement, and are there sufficient trained operator-instructors to meet it?

(*c*) Are there any problems in the maintenance of job analyses and, if so, what specialist advice is required?

(*d*) Are learning times being maintained and are any adjustments necessary?

(*e*) Are the most suitable people being selected as operator-instructors or is any change required in selection methods?

(*f*) Are the services of the training department or staff adequate, and are they sufficiently close to the needs of the job?

There will be many firms, particularly the smaller ones, where specialist training staff either do not exist or are very limited in what they can do. In such firms, even greater reliance may be placed on experienced operators for the instruction of new workers, and the detailed organisation needs to be the constant concern of one member of management, who has himself been fully trained in instructional techniques. If he has also been trained to do the training of the operator-instructors himself, so much the better, but this is not always possible and the firm may have to rely on the Department of Employment and Productivity or some other outside agency for this service. It must, however, be realised that the general maintenance of the training scheme and the subsequent coaching that operator-instructors may require will be the firm's own responsibility.

It is important, therefore, that apart from the individual manager who carries overall responsibility, all managers, and particularly supervisors, must be properly briefed on the details of the scheme, the techniques that will be used, and their responsibilities in organising and maintaining an efficient on-the-job training plan.

Instructions to managers and supervisors

The initial instruction that needs to be given to managers and supervisors will therefore vary according to the size of the firm, the extent of the internal training services available, and the kind of training plan that is likely to fit the particular needs of the firm. Whatever the circumstances may be, the general plan needs discussion first of all at management level, and it is extremely helpful, if not imperative, that one manager should be responsible for ascertaining what the requirements are, and what the implications may be if the firm adopts any one particular scheme. The more this individual knows of the various systems that can be used and the techniques employed, the easier it will be to introduce the best practice.

Many firms will need the advice of an expert, either from the Department or from an industrial training board or other training agency during these preliminary discussions. Decisions will be needed on the following matters:

(*a*) Who is the most suitable person to assume overall responsibility?

(*b*) What are the needs of the firm and how far can they be met by experienced operators who can be trained as instructors?

(*c*) To what extent are managers and supervisors already acquainted with the training methods that can be employed and the techniques that can be used?

(*d*) Can an overall training plan for on-the-job training be prepared by senior management before any formal steps are taken to introduce the training?

(*e*) How far ahead of the actual training of operator-instructors should a briefing meeting of managers and supervisors be held, and who should conduct and attend such a meeting.

(*f*) How should the plan be brought to the notice of employees and their representatives?

According to the decisions reached, a more detailed plan can be established. If the firm has had little experience in organising training, the first step may be for the selected manager, who will carry general responsibility, to attend an appropriate training course, or alternatively for the firm to employ or arrange for a more junior manager to be trained as a training officer who will specialise in the techniques of on-the-job instruction. Whatever decision is taken on the need to use outside assistance, in the first place it is important that someone permanently within the organisation acquires the necessary expertise and is able to render on a more continuing basis a general service to the organisation as a whole.

If these first requirements have been satisfied and a detailed training plan prepared, a decision is necessary on how managers and supervisors who will be directly concerned are to be briefed on the scheme, their responsibilities in regard to it, and the form the briefing shall take.

It is to be noted that the course for training operator-instructors which is provided for firms by the Department's Training Development Service is preceded by a separate session for instruction and briefing of managers and supervisors which normally takes place at least one week before the actual training of selected operators. In the example given on page 23, the iron and steel industry scheme for such training, the briefing of managers and supervisors also occurs some days ahead of the actual training of the operatives. Circumstances will dictate the best arrangement, but the Committee came to the conclusion that in the case of a firm's introduction of such training, the briefing of managers and supervisors should be sufficiently ahead of the actual training of an operator-instructor to enable the utmost care to be given to the selection of the right people to be trained, and for a full explanation of the plan to be made to all concerned.

When the firm has already had experience in operating such schemes and good selection methods are well established, a short briefing of supervisors immediately prior to the training of the operator-instructors may be all that is required. Even if supervisors have taken part in such briefing before, it is essential that matters affecting those that are about to be trained and their jobs should be discussed, so that the tutor responsible for their training is able to tie in his instruction to their actual needs. The job methods to be used, the availability of job analyses and the particular needs of an individual will always need review at the supervisors' briefing session. Sample programmes for one-day briefing sessions for senior managers and for supervisors, that might be used in the case of an initial introduction of the Department's course for the training of operator-instructors are given in *Appendices* 11 *and* 12.

The selection of operator-instructors

It will not always be easy to identify the experienced worker who is likely to make a good on-the-job instructor, but great care must be taken if the investment in his training as a part time instructor is to achieve the desired results. Unless the worker so selected is to be trained as a full time instructor, it should be made clear to him, and to all concerned, that after training he will return to his normal job and be available for the training of any new recruits or other workers who may be assigned to him from time to time.

The number of operator-instructors required in any particular work situation will depend on:

(*a*) the kind of job that has to be done and the amount of skill involved;

(*b*) the time required to bring a new worker up to the experienced operator rate of working;

(*c*) the training requirement in terms of labour turnover, expansion needs or new methods.

The final decision on how many should receive training will clearly be a matter for the immediate supervisors to decide in consultation with the departmental head.

Personal characteristics

In choosing an experienced worker for training as an instructor, it will be natural to look for someone who is good at his job. But it must not be assumed that the best worker is necessarily the best instructor. Other qualities must be taken into account. There is no standard specification; many different kinds of people can succeed as instructors provided they have a few fundamental personal qualities. These can be listed as follows:

(*a*) An interest in and helpful attitude towards other people, and willingness to help them when they are in difficulties. This attribute requires no psychological test to discover, as previous behaviour will have revealed it.

(*b*) An ability to think clearly and to work in an orderly and tidy manner (especially when co-operating with others).

(*c*) An ability to communicate, i.e. to convey an idea in simple language, perhaps to illustrate it by word or deed and to continue until the point is made.

Other qualities such as patience, good humour, flexibility of mind, readiness to adopt a new idea, may be valuable in relation to the requirements of a job. Sometimes there will be an optimum age range, but as a general rule the best selection can be made irrespective of age.

Although great care may be exercised in the selection process, mistakes may often be made which will not become apparent until after the training has begun. The operator may realise this during the training course, or it may become evident to the course tutor. It is always better to face the facts in such cases, and after consultation with all concerned to give up the training. It is often advisable to make this possibility known to those who are selected and to assure them that no difficulty arises if they withdraw from the course. The course tutor is normally in a good position to assess an individual's potentiality as an instructor during the progress of the course, and if he has doubts, it is advisable to enter into immediate consultation with those responsible for his selection.

Some examples of applications

It is recognised that when managers and supervisors understand the objectives and techniques of operator training they will usually work out plans which are tailored to suit their own special requirements. The following examples are given of the way in which certain firms have organised on-the-job training by operator-instructors to suit their own requirements.

Fettling shop in a specialised iron foundry

The fettling shop employs 20–25 workers on a piecework basis. Fettling is the process of cleaning up or dressing a casting after shot blasting and annealing. The work is not highly skilled, but experience shows that the best workers have a rhythmic well-paced habit in handling the variety of tools which the job calls for (hammer, punch chisel, portable grinders and cutters and pedestal grinders). Those who acquire a good specialised knowledge of "fettling method" can develop speed and stamina; otherwise there is inefficiency due to fatigue, low output and poor workmanship.

The management of the firm, having become fully convinced of the value of training, recently nominated 13 chargehands from various shops to be trained as part time instructors on the job. Among them was one from the fettling shop who joined a group of 7 who trained half a day a week for fourteen weeks. The other 6 were sent to a 2 weeks external full time course. The home based group was brought together weekly for some formal instruction. At each session a project was set, and members spent a further half day during the week working at the project under a course tutor provided by the Industrial Training Service. By this method the fettling instructor at the end of the course had completed his job analysis work, drawn up a draft programme and written several instruction plans.

After the course, follow up (under the course tutor) was devoted to completion of instruction plans, modifying (where necessary) and finalising the draft programme, preparing a recording system, and actually trying out the programme.

Each new starter in the fettling shop is now met by the instructor, who provides the induction setting and starts skill training in the first three days. Speed, stamina and widening of range follow. At first the instructor needs to spend about half his time with the trainee, gradually reducing his attention till only occasional guidance is needed. The instructor keeps records and tells the learner what is expected of him and how he is performing.

The benefits of the new training and its systematic organisation have now begun to be felt. It used to take as much as nine months to bring a newcomer up to experienced worker standard. Now the estimated period is about five weeks, and wastage during training has been greatly reduced.

The six chargehands who were sent for full time training away from their work required a much longer follow-up period and the practical work they did was not so relevant as it was with in-company training.

Paper conversion company

This company, manufacturing corrugated fibre-board cases, employed 40 female workers on a double day shift in the assembly of corrugated fibre-board divisions for insertion into cases used by whisky and gin distributors, food manufacturers, etc. The divisions, which assembled together to form a number of compartments within the cases, were manufactured in a wide range of sizes, the slots varying in number from 1 to as many as 14 per piece. The workers received the slotted pieces, unassembled as they came from the slotting machines, and their task was to assemble the pieces together in the correct manner, to collapse the resulting divisions, to place them aside in suitable piles, and then to tie them in bundles. Difficulty was being met in bringing the speed of output of new starters up to that of experienced workers, so that they could earn satisfactory bonus payments in return for considerable effort. It was therefore decided to introduce a systematic training scheme with the help of a specialist in operative training. He first carried out a detailed analysis which enabled him to define the knowledge and the skills which were required. Then a number of exercises were arranged to develop these skills, and two operator-instructresses were trained, one for each shift.

All training took place at a bench alongside the production benches. The exercises were carried out on production work chosen to meet the needs of the trainees, who were normally recruited in pairs. The operator-instructress demonstrated the initial basic exercises, and then supervised the production exercises until the trainee had acquired the skills and knacks of the job. The trainee then worked, still under tuition, at perfecting the skills required for the whole range of work, and at developing stamina, i.e. the power to maintain the necessary speed of assembly for the full working day without undue fatigue.

During this building up period the instructress was able to reduce the amount of tuition and ultimately to return full time to her own bench until a new pair of trainees arrived.

In this way, under proper instruction, the trainee's ability developed progressively, both in skill and stamina, her difficulties were dealt with as soon as they arose, and on an average she attained the standard of an experienced worker in one-quarter to one-third of the previous time.

This scheme of training succeeded because everyone concerned – instrutresses, operatives, chargehands, foremen, training staff, bonus and wages clerks, and works manager – were all aware of what was intended and of the part they had to play.

A large establishment in the rubber industry

This programme is the outcome of twenty years experience of shop-floor training which originated with the use of T.W.I. Job Instruction. Although the main programme was first designed for training supervisors, it was soon realised that selected experienced operators would have to be drawn in, if thorough and effective training on the shop floor was to be achieved.

In studying the existing scheme, it must be realised that all supervisors have previously attended a full-time eleven weeks course in which they have become well acquainted with job instruction techniques. Departmental heads and managers have also had similar training in the earlier stages of their careers. The scheme has therefore been well established for a number of years, and is accepted by all concerned as a normal part of general works organisation and management. Appreciation courses, that might be needed in the case of a new application, are no longer necessary, although as time goes on, refresher courses have to be introduced.

The works is divided into a number of manufacturing departments, and the senior foreman in each department carries the responsibility for training. In addition to his other duties he is, in fact, the department's 'training officer'. He is responsible for the induction of new or transferred workers, and for the selection of operator-instructors who are required to train them. This selection is made after consultation with the section foreman who will subsequently be responsible for the direct supervision and coaching of the operator-instructors after they have been trained. When a selection has been made, the senior foreman sends particulars on a printed form to the Works Training Department, which then arranges for the training of the operator-instructor as soon as a group can be formed. Courses are organised at intervals, according to demand, and a record is then initiated for each operator-instructor who attends the course.

The course is of 12 hours' duration, divided into two-hourly sessions, and concentrates solely on job analysis and development of instructional skill. All work methods have been previously studied, and job breakdowns are already in existence. Nevertheless, the operator-instructors are taken through the analysis drill as an essential part of the development of instructional skill. Actual job breakdowns are done in the operator-instructor's own workplace, and practice in instruction is done on the shop floor, supervised by the course tutor who is a member of the firm's training staff. A record of performance on the course is made on a record card, and if the course tutor has any doubt about the suitability of a selected person, consultation will take place with the senior foreman about any action that may be necessary.

As soon as the trained operator-instructor returns to his normal work, the intermittent allocation of a trainee to him, according to need, is the responsibility of the section foreman, who is then responsible for any supervision and coaching that may be required. The operator-instructor will work on his normal payment basis until he receives a trainee. At that time he is transferred to an 'average earnings' basis of payment whatever his output may be, and his prime duty is to train the new worker up to experienced-operator rate of working in the prescribed training time. Both instructor and new worker attempt during this period to maintain output from the machine, the new worker gradually acquiring the full range of skill necessary to do the complete job. The actual training programme brings the new worker into the operation at some of the simpler stages at first, and progressively extends his training over the more difficult stages until he ultimately becomes competent in doing the whole job himself. As soon as he is capable of working on his own at a quality and speed that will assure a satisfactory earning capacity, the new worker moves off to his own workplace, and the operator-instructor reverts to his normal work and his normal payment basis of working.

The jobs in the different departments vary considerably in learning time.

Some may be as short as 5 to 6 hours, while some of the more complicated may take from 12 to 16 weeks.

As previously stated, all jobs in all departments (including canteen, truck driving etc.) have been analysed by the T.W.I. breakdown method, with some modifications. The modifications were introduced after experiments had been conducted using a more sophisticated form of job analysis. The section foreman is responsible for the accuracy and up-to-dateness of the 'breakdowns' and alterations are made as soon as there is a change or improvement in method. The senior foreman (shop training officer) carries overall responsibility for the maintenance of the system.

Each new worker, as he enters a production department, receives a training card which is registered in the training department. His progress in his training up to experienced operator rate of working is recorded on the card. When he is placed on his own the instruction period formally ends and the card is returned to the Training Department.

The general features of this scheme may be summarised as follows:

(*a*) It has general applicability throughout the whole works.

(*b*) It operates as a fully integrated part of normal work routine and the Training Department has a full and continuing record of all 'on-the-job' training that is taking place.

(*c*) Its success depends on the full understanding and participation of managers and supervisors.

(*d*) Its operation is smooth and continuous and supervisors can operate it without undue effort and attention.

(*e*) The training of operator-instructors is short and simple, and comparatively inexpensive.

(*f*) Output is maintained while training is under way.

(*g*) It is generally known to have full management support.

Process industry - a steelworks

The training of operatives in a steelworks can present special difficulties. The cost of errors due to faulty operation can be heavy, in damage to plant, in down-time, and in materials.

The training difficulties may arise from any of the following factors:

(*a*) The plant is often very costly, so that the provision of spare plant for training purposes is out of the question.

(*b*) The plant is normally in continuous operation, so that training cannot be usefully or conveniently arranged at times of breakdown or maintenance shut-down.

(*c*) The plant is operated by a team, in which one man's work is dependent upon, and synchronised with, the work of other members of the team.

(*d*) Most jobs consist of a number of tasks requiring a range of skills and knowledge.

(*e*) It is often not possible for the foreman to keep the newcomer under direct supervision as he has many other duties apart from training.

Normal manning procedures

The trainee or new worker will normally join a team as vacancies occur, either from the adult labouring gang or from the junior operative training scheme. He will join at the lowest level and later move up to more senior positions, learning each job ahead of him as he progresses. The most senior operative, who has a wide range of duties, is responsible to the foreman for the satisfactory working of the plant by the team as a whole.

If, for instance, a senior operative is promoted or retires, his place will be taken by the most senior operative at the level below, irrespective of shift. The latter's place is then taken by the most senior operative at the next level down, and he may also come from another shift. This movement proceeds down the line, ultimately providing a vacancy at the bottom for a newcomer. In the past it has been the practice for the training of each man in his new job to be accomplished in part by the foreman but more generally by other members of the team nearest to him. The advantage of using skilled operator-instructors in the working of such a team becomes apparent if on-the-job training is to be made more effective.

The introduction of a more effective method

A scheme has been devised which is designed to introduce a trained operator-instructor at each of the principal operational levels. Where a large crew is involved there are many junior jobs that can be covered by one operator-instructor, but each of the more senior levels, and most levels in a small crew operating a highly mechanised plant, will require an operator-instructor.

A plan, therefore, has been devised that will enable an experienced worker at each level to be trained in job instruction without disturbing the normal manning of the plant.

By introducing a relief man where necessary, arrangements can be made to select the most suitable operative (often the most senior) at each level, to receive job instruction training. These experienced operatives attend a six day course, planned on lines similar to those indicated in *Appendix* 13 for days "D to D+5" or later. The arrangement of the course and the number attending at any one time needs careful planning to fit the manning schedules of the plant.

Operator-instructors so selected and trained will then be responsible for the training of all newcomers to their particular level of work. In the course of time, these instructors will themselves be promoted within the crew and be available, with further coaching, to undertake instructional duties at the higher level.

In a works in which a junior operative scheme exists, it is possible to select young workers to receive initial training in job instruction before they are recruited to the plant crew. If most members of the crew receive this early training, the amount of subsequent training required is proportionately reduced. But the successful working of a scheme of this kind depends on careful planning and anticipation of the future manning requirements of the plant.

Preparing to introduce the scheme

Before any steps are taken to introduce such a scheme, management must determine the extent and nature of the training that a competent operative will require at each level of the team's work. Job descriptions must be prepared and the required knowledge and skill must be determined. Assessments must be made of the knowledge and skill the learner will have acquired in his previous job, and how much needs to be added for competence at the higher level. A decision will be required on what should be taught on- or off-the-job, and to what extent union collaboration will be required.

Introducing the training programme

Departmental managers and supervisors who are unfamiliar with the training techniques will require an appreciation session, in order that they will be able to play their part and establish with training staff the training requirements. This appreciation and discussion should be done in advance, and the plans made at least 14 days before the programme is to be put into operation, to allow time for necessary preparation (see *Appendix* 13).

As soon as the training requirements have been established, management, in co-operation with the union, will need to approach the men who are likely to be selected at each level as operator-instructors, and obtain their agreement to the plan.

The manager, foreman and training officer will need to understand the part each has to play, and the following points need consideration and appropriate action:

(*a*) the actual positions in which training is of the highest priority;

(*b*) the need for job descriptions or the checking of existing ones; the preparation of training requirements;

(*c*) the arrangements for consultation with union representatives;

(*d*) the suitability of existing senior operatives at each level for training as operator-instructors.

One week is allowed for covering these activities.

A further meeting of departmental managers, supervisors and the training officer will then be necessary with the individual who will be responsible for the training of the operator-instructors. This meeting should be arranged, if possible, about 7 days before the actual training is commenced to allow time for the necessary action (see *Appendix* 13). Some of the points to be discussed are as follows:

(*a*) To confirm what has to be taught on the job
   (i) the recognition of what the operator will already know;
   (ii) the determination of what instruction can be given off the job;
   (iii) the arrangements for continued supervision on the job while the operator-instructor is gaining experience.

(*b*) To determine the timing of the programme and the release arrangements for the operators who need instructor training
   (i) estimates of the time required for training in job analysis and instructional techniques;
   (ii) estimates of the time required by the operator-instructors in analysing their own jobs and in the making of breakdowns;
   (iii) detailed schedules for the movement of operatives for off- and on-the-job training.

Maintaining the training programme

Once the training programme has been introduced and is thoroughly understood, the amount of time spent in preparation will diminish to include the inauguration of new managers and supervisors, and a review of the pre-course needs.

The long term objective of the above training programme is to build up a cadre of operator-instructors throughout all levels. By so doing, a promoted crew member is not only in the care of a trained man, who can also instruct, but is received into a crew of trained men, some of whom may also be instructors. This situation helps to create confidence, ensure safe working and high quality output.

Conclusions

The Committee was unanimous in its view that there was an urgent and widespread need for assistance to firms, and particularly the smaller ones, in the introduction and maintenance of effective systems of 'on-the-job' training for 'operatives'. It recognised that although 'off-the-job' training arrangements provide the best solution to many training problems and should be adopted wherever possible, the bulk of operative training, particularly among the smaller firms, will remain to be done 'on-the-job'. At present it is commonly found that this is done by asking experienced operators to pass on their skills as best they can, with little or no guidance or supervision.

The Committee believes that action on the lines outlined in this Report, which involves the training and use of part time operator-instructors, would greatly improve the standards of industrial training, particularly among adults.

The detailed conclusions of the Report are summarised below:

Need for operator-instructors

A great deal of industrial training must be done on the job whatever may be done to promote off-the-job training activity (page viii).

Past experience has proved that whatever degree of responsibility for training may be placed upon supervisors, there is widespread dependence on experienced operators in passing on their knowledge, skills and know-how to the less experienced (page viii).

Assessment of need

An effective scheme requires:

(*a*) recognition as part of a firm's training policy;

(*b*) integration with the normal works organisation and control system;

(*c*) briefing of selected staff on how to organise and operate the training plan;

(*d*) selection of experienced operators for training as instructors;

(*e*) training of those selected in appropriate instructional techniques (page 1).

The number of operatives at all levels of skill employed in industry is as great as, if not greater than, the number of skilled craftsmen, and their training needs attention comparable with that given to craftsmen (page 1).

If allowance is made for labour turnover, retirement and death, it is estimated that about 15% of the nation's total operator force needs some form of training in any one year (page 2).

There are very wide variations in the length of training periods required for different operative jobs. Such periods may be as short as a few hours, or they may extend over weeks or months (page 2).

It is not possible to make a precise assessment of the training effort that would be required if schemes such as those outlined in this Report were widely adopted. Nevertheless some indication is obtainable if certain assumptions are made (page 2).

Assuming an average training period of 4 weeks and an instructor-learner ratio of 1 : 2 at least, the requirement of operator-instructors might be of the order of one to every 100-150 operators. The actual number required in a specific case will vary according to the degree of skill each job may require and to the nature and variety of work involved. Even firms with very small numbers employed on a particular job will find it advantageous to have one operator-instructor available for that job (page 2).

To reach this level of training effort the following conditions must apply:

- (*a*) management need to be convinced that worthwhile, tangible results can be achieved;
- (*b*) the training plan must be easy to operate and tailor-made to the given situation;
- (*c*) it must be suitable for recognition under the grant regulations of the appropriate training board.
  (Page 2.)

Survey of existing courses for the training of operator-instructors

After a review of existing practice, the Committee reached a number of general conclusions which are set down in the following parts of this report (page 6).

The operator-instructor training course

The course itself must be an integral part of an overall plan which involves management and supervision as outlined on page 1.

The aim of the course must be to develop, in a practical way, the operator-instructor's knowledge and skill in using instructional techniques applicable to the actual work in which he is engaged. The course should be long enough but no longer than is necessary to develop sufficient skill and understanding for subsequent improvement by coaching on the job (page 6).

Whatever the length of the course may be, its content and time allocation should be broadly as follows:

(*a*)	Background information, theory and techniques	25%
(*b*)	Practical demonstrations and individual practice periods in the training room	25%
(*c*)	Individual practice on the shop floor or in the office	50%

(Page 7.)

In many cases, experience has shown that a course of about 10 working days or even longer is essential, though where overall training plans are well established, and training can be linked very closely with the operator-instructor's own workplace, a shorter period can be effective (pages 7-8).

For efficient tuition, the size of the training group should be a minimum of six and a maximum of eight. Small firms may find it necessary to combine, but great care must be taken to keep any training done away from the workplace closely related to each operator-instructor's own work. The trainees should be able to return to their own workplace for individual practice on the shop floor or in the office (page 8).

The content of the course and method of instruction to be used should follow the general lines of guidance set down (pages 8–10).

Examples of courses designed in accordance with the guidance given (pages 10–12) are illustrated in *Appendices* 7 *to* 10 inclusive.

Introducing and maintaining an on-the-job training scheme using operator-instructors

It is absolutely essential that there should be effective organisation and administration by management in support of the use of operator-instructors (page 13).

The firm's training staff (or the manager carrying responsibility for training) must play a leading role in the preparation and execution of the plan, but the continued implementation of the training must be done by managers and supervisors, who need to understand and accept their responsibilities for training (pages 13-14).

The working of the plan must be co-ordinated between supervision and the training service, and must be kept under regular observation by a senior manager (page 14).

Whenever possible, a member of the training staff (or the manager with training responsibility) should attend a course on the training and use of operator-instructors (page 14).

If a firm, by reason of its limited size or lack of facilities, is unable to train its own operator-instructors, it should enlist the aid of the DEP or other outside training agency. It is important that, before the actual training of operator-instructors is undertaken, at least one member of management receives instruction on how to introduce and operate the plan and on how to provide the subsequent coaching on the job (pages 14-15).

Instructions to managers and supervisors

These will vary according to the training experience the firm has already had. When a new course is proposed, all the managers and supervisors concerned should be fully briefed beforehand so that they:

(*a*) know what is going to be done, and why;

(*b*) know what their own part in the operation will be;

(*c*) can assess the training need of their own departments or sections;

(*d*) make time for, and get the necessary guidance in, selecting the most suitable operators for training (pages 15–16).

Firms with previous experience can confine the briefing of managers to the problems involved in the department or section in which additional operators need training. If matters affecting selection have been adequately dealt with on previous occasions, the briefing can take place immediately before the new training course (page 16).

The selection of operator-instructors

All supervisors responsible for selection need careful guidance on the personal characteristics sought in a potential operator-instructor. These may be summarised briefly as follows:

(*a*) interest in and a helpful attitude towards other people,

(*b*) ability to think clearly and to work in an orderly and tidy manner,

(*c*) ability to convey an idea in simple and concise language.

Adequate knowledge and skill is assumed, but it does not necessarily follow that the most experienced operator will make the best instructor (pages 16-17).

Initial selection should be provisional until it is confirmed or cancelled on attendance at the course. The operators concerned should know that this will happen and that no harm is done if either the course tutor or the man himself becomes convinced that the initial selection was a mistake (page 17).

Some examples of applications

Any successful plan needs to be tailor-made to suit a particular work situation and each firm needs to develop its own plan. Nevertheless much can be learnt from the experience of others, and a few examples of particular interest are given on pages 18-24.

List of Appendices

Appendix *Page*

1. DEP Training Development Service for operator-instructors . 30
2. DEP Instructor Training College course on instructional techniques for industrial instructors 33
3. DEP Three Weeks Course on instructional techniques for industrial instructors (Iron and Steel Industry Training Board) . . 41
4. DEP Modified One Week Course on instructional techniques for industrial instructors 52
5. Two weeks basic course for Wool, Jute and Flax Industry . 54
6. Note on Instructor Training Courses run by the Industrial Training Service and examples of courses 55
7. Operator-instructors' course. Example syllabus of in-plant two weeks course 59
8. Operator-instructors' course. Example syllabus of out-of-plant two weeks course 61
9. Operator-instructors' course. Example syllabus of in-plant six-day course 64
10. Operator-instructors' course. Example syllabus of out-of-plant one week course 66
11. Operator-instructor training. Example of one day briefing session for senior management 67
12. Operator-instructor training. Example one day information course for immediate supervisors of operator-instructors . . 68
13. Operator-instructor training. Example programme of job instruction training on continuous process 69

APPENDIX 1
See Page 2

Department of Employment and Productivity

THE TRAINING DEVELOPMENT SERVICE FOR OPERATOR-INSTRUCTORS

There are numerous examples in industrial concerns of jobs which present to management considerable training difficulties.

These jobs usually include operations which require a good deal of manual dexterity, ability to make rapid decisions and accurate recognition on the part of the operator of operational changes in components, materials, tools and processes. Before such operations can be taught the skills involved must be appropriately analysed.

It is not unusual to find that only one or two operators have the full capacity and skill to perform the tasks at adequate speed and quality and a training problem becomes acute, particularly when new entrants or transferees are to be given the task to do.

Departmental heads are often at a loss as to how to organise the requisite training. Junior supervisors, lacking the exact knowledge and skill required, may make rough and ready attempts to instruct the new worker, or they may, in many cases, leave newcomers to gain as much knowledge and skill as they can glean from watching the skilled operator at work. It is rare that learners achieve experienced worker standards as well or as quickly as they should by such methods.

To assist industry to overcome such training problems, the TWI Section of the Department have prepared and are offering to industry a new Training Development Service for Operator-Instructors.

This comprises a course wherein the senior management representatives are given advice and practice in planning training, selecting the best operators as instructors, arranging for their development in instructing techniques and supervising the progress they make.

Supervisors also attend a briefing session to receive information on the instruction that is to be given to operator-instructors, how instruction periods and exercises can be devised and how experienced workers can be utilised and assisted to be good instructors.

Selected skilled operators are then trained in the techniques of preparing and giving good instruction to those they have to instruct.

The whole programme is devised on the basis that a great deal of instruction to newcomers and the less skilled must inevitably take place on the shop floor, and that much will depend on the ability of selected operator-instructors to give the instruction that is necessary. The programme recognises that success in training skilled operators to give this instruction will depend on the support and understanding the programme receives from the management and the operator-instructors' own supervisors, hence the need to bring them into the scheme by arranging for their attendance during the course.

Syllabus of the Training Development Service (for Operator-Instructors)

Information Session for Senior Management (Departmental Heads and Above)

1 The training need
2 The work of the course
3 The selection of operator-instructors
4 The training of operator-instructors
5 Using the operator-instructor
6 The sequence of the instructing technique

Note: The above session requires approximately three hours for completion. It should be held some days before the course for operator-instructors is held.

Briefing Session for Section Supervisors (Foremen, chargehands etc.)

1 Management introduction
2 The training need
3 The work of the course
4 The selection of operator-instructors
5 The training of instructors
6 The sequence of the instructing technique
7 The preparation of instruction – knowledge
8 The preparation of instruction – skills
9 The faults analysis
10 How to instruct – the "Part" method – special exercises – target times – training records
11 Co-operating with operator-instructors

Note: The above briefing session requires approximately three hours. It should be held some days before the course for operator-instructors is held.

The Operator-Instructors' Course

Course details and subjects

1 The objectives of the course
2 What a learner needs to know
3 The sequence of the instructing technique
4 Checking the method of doing the job
5 The preparation of instruction – knowledge
6 The preparation of instruction – skills

7 Coaching in making detailed breakdowns – group room practice

8 Shop floor practice – preparing detailed breakdowns of skills involved in a job

9 Making an instruction breakdown

10 The faults analysis

11 Presenting instruction according to plan – the "Part" method and special exercise

12 Presenting instruction according to plan – group room practice exercises

13 Developing production speed and quality

14 Points to note in the development of skill
    the synthesis of instruction – target times – training records
    – co-operation with supervisors

15 Shop floor practice in instructing techniques

16 Individual coaching of operator instructors by the trainer

17 Combined meeting of managers, supervisors and operator-instructors to finalise immediate training arrangements for each section involved

A four-day course for operator-instructors is available and may be attended by up to six nominees. Alternatively, a five-day course will allow for the training of two additional operator-instructors.

A suggested pattern of development

Employers are advised to have the two three-hour sessions presented on one day sufficiently in advance of the operator-instructors' course to allow for the proper selection of those who are to attend it.

Consideration should be given to the number of operator-instructors to be trained and a plan should be made covering their allocation into four or five-day courses.

APPENDIX 2
See Page 3

Department of Employment and Productivity

INSTRUCTOR TRAINING COLLEGE

Course on instructional techniques - Synopsis

Sessions	
1	**Outline of the course** Introductions Why training for instructors? Principal course activities Instructional practices Obtaining maximum benefit from the course
2	**The role of the instructor** A vital link The needs of the organisation The needs of the student The needs of the instructor Appearance and manner Attitude towards training
3	**Training — some problems concerning students** School leavers The more mature students A common problem
4	**Why and how people learn** The basic desire to learn Incentives to learning How people learn The development of skill
5 & 6	**Instructing the individual worker** Objectives Selecting units of instruction Preparing a unit of instruction Checking the learner's performance

Sessions	
7	**Example demonstration by College lecturer** During this session the class lecturer will, as a guide to class members, use the recommended methods to demonstrate a trade subject.
8, 20, 31, 36, 44, 52, 62 & 63	**Guided preparation** These sessions are spent by the members in the lecture rooms on one of the following: (*a*) preparing notes or breakdown sheets for their own individual practices, (*b*) practising on the blackboard, or (*c*) preparing visual aids. College lecturers are in attendance to advise and assist where necessary.
9, 10, 11, 12, 32, 33, 34, 35, 37, 38, 39, 40	**Practice demonstrations** During these sessions every member will undertake three practice demonstrations, each of approximately five minutes' duration. Each demonstration will be followed by a commentary given by a college lecturer. The aim of the commentary is to help the member concerned to develop his or her instructing abilities.
13 & 14	**Lecturing techniques** Preparation Presentation Answering questions Assessment and revision
15 & 16	**Blackboard techniques** Planning the blackboard Style Sketches Calculations Lay-out Putting the plan into practice Headings and sub-headings

Sessions	
17 & 18	**Visual aids** The overhead projector Blackboards Charts and diagrams The flannel board Magnetic board Plastigraph Models Samples
19	**Example trade talk or lecturette by college lecturer** A class lecturer, during this session, gives an example trade talk as guidance to the members. The subject chosen will vary according to the trades of the members.
21, 22, 23 & 24	**Practice trade talks or lecturettes** During these sessions, each member will give a practice trade talk or lecturette of approximately fifteen minutes' duration. A commentary follows each practice similar to that described for practice demonstrations.
25	**Note-taking** The purpose Equipment for note-taking Taking main headings from the blackboard Good note-taking.
26 & 27	**Tour of vocational training classes followed by a discussion** A conducted tour of the adjacent Government Training Centre is made during which approximately 450 trainees are seen engaged in over 28 trades. The training methods observed are discussed.

Sessions	
28	**Arranging a training syllabus** Policy Consultations Liaison Theoretical work Practical work Outline syllabus Problems
29	**Introduction to programmed learning** Results achieved Types of programme (*a*) linear (*b*) branching Scope Programmed learning and the instructor
30	**Film** This illustrates good instructional techniques.
41 & 42	**The class-room lesson** Objectives Preparation Presentation
43	**Example 15 minute lesson by college lecturer** During this session a college lecturer will, as a guide to class members, deliver an example lesson in the method described in session Nos. 41 and 42.
45, 46, 47 & 48	**Practice lessons** In these sessions each class member will be responsible for delivering one practice lesson of about 15 minutes duration. The subject chosen will be from the class member's basic trade. A commentary will follow each practice.

Sessions	
49	**Review of practice lessons** The practice lessons are reviewed and discussed during this session. Special attention is drawn to the more important and the more common errors and weaknesses.
50	**Instructing a group of workers (workshop lessons)** During this session, methods will be explained whereby the techniques described in session Nos. 41 and 42 may with advantage be used in certain circumstances for practical instruction in the workshop.
51	**Example of a demonstration to a group** In this session a college lecturer will, as a guide to class members, present a practical workshop demonstration to a group. He will apply the techniques referred to in sessions 41, 42 and 50.
53, 54, 55 & 56	**Practice group demonstrations** During these sessions each class member will present a practical workshop demonstration to a group of his colleagues. The lesson techniques will be employed. A commentary will follow each practice.
57 & 58	**Aids to instruction — projection equipment** Sources of supply Selection and use Sizes and types of film Film strips Slides The episcope The film loop projector The screen
59	**Assessing progress** The objective Assessments Standards of assessment

Sessions	
60	**Reporting progress** Written reports Types Amount of information Opinion
61	**Example 30 minute lesson** During this session a college lecturer will, as a guide to class members, deliver an example lesson in the methods already described.
64, 65, 66, 67, 68, 69, 70 & 71	**Practice lessons** In these sessions each class member will be responsible for delivering a practical lesson of 30 minutes duration. The subject chosen will be an elementary one from the class member's basic trade.
72	**Course revision and summing-up** This session is spent in recapitulating the essentials of instructional techniques and a discussion of any outstanding points. Members' views on the course are invited.

D.E.P. INSTRUCTOR TRAINING COLLEGE

Timetable of Course on Instructional Techniques

1st week	8.45 a.m. 9.30 a.m.	9.35 a.m. 10.20 a.m.		10.40 a.m. 11.25 a.m.	11.30 a.m. 12.15 p.m.	12.20 p.m. 1.05 p.m.		1.50 p.m. 2.35 p.m.	2.40 p.m. 3.25 p.m.		3.45 p.m. 4.30 p.m.
Monday	COURSE MEMBERS TRAVELLING AND REPORTING AT INSTRUCTOR TRAINING COLLEGE					Outline of the course (1)	BREAK FOR LUNCH	The role of the instructor (2)	Training – some problems concerning students (3)	BREAK FOR TEA	Why and how people learn (4)
Tuesday	Instructing the individual worker (5)	Instructing the individual worker (6)	BREAK FOR COFFEE	Example of a demonstration to an individual worker (7)	Guided preparation for first practice demonstrations (8)	First practice demonstrations (two members per session) (9)		First practice demonstrations (10)	First practice demonstrations (11)		First practice demonstrations (12)
Wednesday	Lecturing techniques (13)	Lecturing techniques (14)		Blackboard techniques (15)	Blackboard techniques (16)	Visual aids (17)		Visual aids (18)	Example lecturette or trade talk (19)		Guided preparation for practice lecturette (20)
Thursday	Practice lecturettes (two members per session) (21)	Practice lecturettes (22)		Practice lecturettes (23)	Practice lecturettes (24)	Note-taking (25)		Tour of GTC and discussion on the vocational training methods (26)	(27)		Arranging a training syllabus (28)
Friday	Introduction to programmed learning (29)	Film (30)		Guided preparation for second practice demonstrations (31)	Second practice demonstrations (two members per session) (32)	Second practice demonstrations (33)		Second practice demonstrations (34)	Second practice demonstrations (35)		

Each member undertakes the following practices in the sequence shown:—

1st	5 min	Practice demonstration (workshop)	Sessions 9, 10, 11 and 12
	15 min	Lecturette (classroom)	Sessions 21, 22, 23 and 24
2nd	5 min	Practice demonstration (workshop)	Sessions 32, 33, 34 and 35

2nd week	8.45 a.m. 9.30 a.m.	9.35 a.m. 10.20 a.m.		10.40 a.m. 11.25 a.m.	11.30 a.m. 12.15 p.m.		1.00 p.m. 1.45 p.m.	1.50 p.m. 2.35 p.m.	2.40 p.m. 3.25 p.m.		3.45 p.m. 4.30 p.m.
Monday	Guided preparation for third practice demonstrations (36)	Third practice demonstrations (two members per session) (37)	BREAK FOR COFFEE	Third practice demonstrations (38)	Third practice demonstrations (39)	BREAK FOR LUNCH	Third practice demonstrations (40)	The classroom lesson (41)	The classroom lesson (42)	BREAK FOR TEA	Example 15 minute lesson (43)
Tuesday	Guided preparation for practice 15 minute lessons (44)	Practice 15 minute lessons (two members per session) (45)		Practice 15 minute lessons (46)	Practice 15 minute lessons (47)		Practice 15 minute lessons (48)	Review of lessons and discussion (49)	Instructing a group of workers (workshop lesson) (50)		Example of a demonstration to a group (51)
Wednesday	Guided preparation for practice demonstrations to a group (52)	Practice demonstrations (two members per session) (53)		Practice demonstrations (54)	Practice demonstrations (55)		Practice demonstrations (56)	Aids to instruction-projection equipment (57)	Aids to instruction-projection equipment (58)		Assessing progress (59)
Thursday	Reporting progress (60)	Example 30 minute lesson (61)		Guided preparation for second practice lesson (62)	Guided preparation for second practice lesson (63)		Practice lesson (one member per session) (64)	Practice lesson (65)	Practice lesson (66)		Practice lesson (67)
Friday	Practice lesson (68)	Practice lesson (69)		Practice lesson (70)	Practice lesson (71)		Course revision and summing up (72)				

Each member undertakes the following practices in the sequence shown:—

3rd	5 min	Practice demonstration (workshop)	Sessions 37, 38, 39 and 40
	15 min	Classroom lesson	Sessions 45, 46, 47 and 48
	15 min	(approx.) Practical group demonstration	Sessions 53, 54, 55 and 56
	30 min	Classroom lesson	Sessions 64, 65, 66, 67, 68, 69, 70 and 71

APPENDIX 3
See Page 3

Department of Employment and Productivity

INSTRUCTOR TRAINING COLLEGE

Course on Instructional Techniques for Industrial Instructors (Iron and Steel Industry Training Board)

Sessions	
1	**Outline of the course** Mutual introductions Why training for instructors? Principal course activities Teaching practices Additional course activities Record of subject matter Obtaining maximum benefit from the course
2	**The role of the instructor** A vital link The needs of the organisation The needs of the student The needs of the instructor Appearance and manner Attitude towards training
3	**Training — some problems concerning students** School leavers The more mature student A common problem
4	**Why and how people learn** The basis desire to learn Incentives to learning How people learn The development of skill

Sessions	
6	**The difficulties of teaching practical skills** During this session a college lecturer will demonstrate a short practical operation containing several rather difficult hand skills from a trade unfamiliar to the majority of class members. The latter will then be invited to attempt to copy what they will have seen. It is anticipated they will be unable to do so. In an endeavour to discover the reason the class should conclude that the jobs contain too many new skills for a learner to master at one time.
7	**Analysing the job and eliminating the difficulties** With the assistance of the class, the job dealt with in Session 6, will be analysed and the various difficulties listed. Ways and means will then be devised in order that each difficulty could be taught separately.
8	**Discussion on learning and teaching** The contents of Sessions 3, 4, 6 and 7, will be open to discussion and general principles agreed before commencing on a particular instructing technique.
9, 10 & 11	**Individual instruction in the workshop** Objectives Selecting units of instruction Preparing a unit of instruction Presenting a unit of instruction Checking the learner's performance
12	**Example demonstration by college lecturer** During this session the class lecturer will, as a guide to class members, use the recommended methods to demonstrate a trade subject.

Sessions	
13, 14, 21, 29, 33, 34, 39, 40, 56, 57, 64, 65, 76, 82, 83, 88, 89, 96 & 97	**Guided preparation** These sessions are spent by the students in the Lecture Rooms on one of the following: (*a*) Preparing notes or Breakdown Sheets for their own individual practices, (*b*) Practising on the blackboard, or (*c*) Preparing visual aids. A lecturer is in attendance to advise and assist where necessary.
15, 16, 17, 22, 23 & 24	**Practice demonstrations** During these sessions every student will give two practice demonstrations each of approximately five minutes duration. Each demonstration will be followed by a guidance commentary given by a college lecturer. The aim of the commentary is to help the student concerned to develop his or her instructing abilities.
18, 19 & 20	**Tour of the Government Training Centre followed by a discussion** A conducted tour of the adjacent GTC is made during which approximately 450 trainees are seen engaged in over 28 trades. The training methods observed are discussed.
25	**Revision and discussion on workshop instruction** This session will be spent on recapitulating the essentials appertaining to practical instruction and in a general discussion on the application of the suggested principles.
27 & 28	**The lecture** Preparation Presentation Answering questions Assessment and revision

Sessions	
29 & 30	**The blackboard** Planning the blackboard Style Sketches Calculations Layout Putting the plan into practice Headings and subheadings
30 & 31	**Trade talk (15 mins) pattern** Timing of a trade talk Object of the allocated period Choosing the subject – examples in various trades Subheadings – choice and type Concluding the talk
32	**Example trade talks by college lecturers** The class lecturers, during this session, give two example trade talks as guidance to the students. The subjects chosen will vary accordingly to the trades of the students, but they will normally be on contrasting types.
35, 36, 37, 41, 42 & 43	**Practice trade talks** During these sessions, each student will give two practice trade talks each of approximately fifteen minutes duration. A guidance commentary follows each practice similar to that described for practice demonstrations.
38	**Safety Precautions** Safety officer and his duties Implementation of the Factory Acts The causes of accidents The prevention of accidents Defective plant and equipment General precautions in various trades Special precautions in various trades

Sessions	
44	**Assessing apprentices' progress** Definition of progress Assessing by observation Assessing by testing
45	**Reporting on apprentices progress** Methods of reporting on progress Suggested heading for progress reports General principles of report writing
46 & 47	**Arranging a training syllabus** Consideration of the company's training policy Consultation with the training officer and other members of the staff Length of the course – training school – production shops Practical instruction Theoretical instruction Use of production work for training purposes Revision and tests
48	**Examination of GTC training syllabuses** Class members will be given ample opportunity to study in detail copies of training syllabuses which are in current use in Government Training Centres.
49 & 50	**Visual Aids** Blackboards Films, Filmstrips, Slides, etc. Charts and Diagrams The Flannel Board Magnetic Board Plastigraph Models Samples

Sessions	
51	**Workshop discipline** 1 the need for control of apprentices (*a*) accepted workshop behaviour (*b*) development of reliability 2 maintaining effective control (*a*) co-operation (*b*) clear instructions (*c*) advice (*d*) timekeeping (*e*) planned working (*f*) discussion as a safety valve (*g*) removing grievances (*h*) staff examples
52	**Note-taking** The purpose Equipment for note-taking Taking main headings from the blackboard Good note-taking
53	**The preparation of a trade lecture** During this session the class lecturer describes the preparation of a trade lecture. Facts are recollected from trade experience and additional facts from text books, trade journals, etc., are added. A complete lecture is formulated in accordance with the method explained in Sessions 27 and 28.
55	**Example trade lecture by college lecturer** The lecturer during this hour presents the trade lecture of which the preparation was described in Session 53.
58, 59, 60, 61, 62, 63, 66, 67, 68, 69, 70 & 71	**Practice trade lectures** During these sessions each student will give two 35 minute practice trade lectures. Each will be followed by a guidance commentary similar to that outlined in sessions dealing with practice demonstrations and practice trade talks.

Sessions	
72	**Revision and discussion on trade talks and lectures** This session will be spent in recapitulating the essentials appertaining to trade talks and lectures, and in a general discussion on the application of the suggested principles.
73 & 74	**The Classroom lesson** Objectives Preparation Presentation
75 & 87	**Example lessons by college lecturers** During these sessions, college lecturers will give, as a guide to class members, example lessons by the methods described in Sessions 73 and 74.
77, 78, 79, 90, 91, 92, 93, 94, 95, 98, 99, 100, 101, 102 & 103	**Practice lessons** During these sessions each class member will be responsible for delivering a practice lesson of about 15 minutes duration and two practice lessons of about 35 minutes duration. The subjects chosen will be elementary ones from the class members' basic trades. A guidance commentary will follow each practice.
80	**Introduction to programmed learning** Results achieved Types of programme (*a*) linear (*b*) branching Scope Programmed learning and the instructor
81	**Workshop instruction — group** During this session methods will be explained whereby the techniques described in Sessions 73 and 74 may with advantage be used in certain circumstances for practical instruction in the workshop. The lecturer will also present an example of this form of instruction.

Sessions	
84, 85 & 86	**Practice group demonstration** During these sessions, each class member will present a practical demonstration to a group of his colleagues. The lesson technique will be employed. A guidance commentary will follow each practice.
104	**Revision and discussion on lesson techniques** This session will be spent in recapitulating the essentials appertaining to the lesson technique, and in a general discussion of the applications of the suggested principles.
105	**Films, filmstrips and episcope** A demonstration is given on the use of the three as instructing aids.
106	**Film** This illustrates good instructional techniques being applied and reinforces the tuition received during the course.
107	**Hints to instructors on the showing of films** Advantages and disadvantages of instructional films Types of training films Presenting a film The use of the filmstrip and episcope
108	**General discussion on training problems** Class members are invited to submit for discussion, problems which they themselves have been faced with, or alternatively, problems anticipated.
109	**General revision** A general revision of learning and teaching and on the various instructing methods used during the course. The importance of accurate assessments and informative reports will be again emphasised.
110	**Farewell address** Brief reiteration of the main points of the whole course. Students' views on the course invited.

D.E.P. INSTRUCTOR TRAINING COLLEGE - LETCHWORTH

Timetable for the three-weeks' Instructional Techniques Course (Iron and Steel Industry Training Board)

1st week	8.45 a.m. 9.30 a.m.		9.35 a.m. 10.20 a.m.		10.40 a.m. 11.25 a.m.		11.30 a.m. 12.15 p.m.		12.20 p.m. 1.05 p.m.		1.50 p.m. 2.35 p.m.		2.40 p.m. 3.25 p.m.		3.45 p.m. 4.30 p.m.
Monday	COURSE MEMBERS TRAVELLING AND REPORTING AT INSTRUCTOR TRAINING COLLEGE							5 minute break	Outline of the course (1)	45 minute lunch break	The role of the instructor (2)	5 minute break	Training – some problems concerning students (3)	20 minute tea break	Why and how people learn (4)
Tuesday	Private study (5)	5 minute break	The difficulties of teaching practical skills (6)	20 minute coffee break	Analysing the job and eliminating the difficulties (7)	5 minute break	Discussion on learning and teaching (8)		Individual instruction in the workshop (9)		Individual instruction in the workshop (10)		Individual instruction in the workshop (11)		Example demonstration by college lecturer (12)
Wednesday	Guided preparation for first practice demonstrations (13)		Guided preparation for first practice demonstrations (14)		Practice demonstrations *(15)		Practice demonstrations *(16)		Practice demonstrations *(17)		Tour of the GTC (18)		Tour of the GTC (*contd.*) (19)		Discussion on tour and vocational training (20)
Thursday	Guided preparation for second practice demonstrations (21)		Practice demonstrations *(22)		Practice demonstrations *(23)		Practice demonstrations *(24)		Revision and discussion on workshop instruction (25)		Private study (27)		The lecture (27)		The lecture (28)
Friday	The blackboard (29)		The blackboard (30)		Trade talk pattern (31)		Example trade talks (32)		Guided preparation for first practice trade talks (33)		Preparation (*contd.*) (34)				

*Class divides, with groups operating simultaneously

2nd week	8.45 a.m. 9.30 a.m.	5 minute break	9.35 a.m. 10.20 a.m.	20 minute coffee break	10.40 a.m. 11.25 a.m.	5 minute break	11.30 a.m. 12.15 p.m.	5 minute break	12.20 p.m. 1.05 p.m.	45 minute lunch break	1.50 p.m. 2.35 p.m.	5 minute break	2.40 p.m. 3.25 p.m.	20 minute tea break	3.45 p.m. 4.30 p.m.
Monday	Practice trade talks *(35)		Practice trade talks *(36)		Practice trade talks *(37)		Safety precautions (38)		Guided preparation for second practice trade talks (39)		Preparation (*contd.*) (40)		Practice trade talks *(41)		Practice trade talks *(42)
Tuesday	Practice trade talks *(43)		Assessment of apprentices' progress (44)		Reporting on apprentices' progress (45)		Arranging a training syllabus (46)		Arranging a training syllabus (*contd.*) (47)		Examination of GTC training syllabuses (48)		Visual aids (49)		Visual aids (50)
Wednesday	Workshop discipline (51)		Note taking (52)		Preparation of a trade lecture (53)		Private study (54)		Example trade lecture by college lecturer (55)		Guided preparation for first practice lecture (56)		Guided preparation for first practice lecture (57)		Practice lecture *(58)
Thursday	Practice lecture *(59)		Practice lecture *(60)		Practice lecture *(61)		Practice lecture *(62)		Practice lecture *(63)		Guided preparation for second practice lecture (64)		Guided preparation for second practice lecture (65)		Practice lecture *(66)
Friday	Practice lecture *(67)		Practice lecture *(68)		Practice lecture *(69)		Practice lecture *(70)		Practice lecture *(71)		Revision and discussion on trade talks and lectures (72)				

*Class divides, with groups operating simultaneously

3rd week	8.45 a.m. 9.30 a.m.		9.35 a.m. 10.20 a.m.		10.40 a.m. 11.25 a.m.		11.30 a.m. 12.15 p.m.		12.20 p.m. 1.05 p.m.		1.50 p.m. 2.35 p.m.		2.40 p.m. 3.25 p.m.		3.45 p.m. 4.30 p.m.
Monday	The classroom lesson (73)	5 minute break	The classroom lesson (*contd.*) (74)	20 minute coffee break	Example 15 minute lesson (75)	5 minute break	Guided preparation for 15 minute lesson (76)	5 minute break	Practice 15 minute lesson *(77)	45 minute lunch break	Practice 15 minute lesson *(78)	5 minute break	Practice 15 minute lesson *(79)	20 minute tea break	Introduction to programmed learning (80)
Tuesday	Group demonstration. The practical lesson and example (81)		Guided preparation for practice group demonstrations (82)		Guided preparation for practice group demonstrations (83)		Practice group demonstrations *(84)		Practice group demonstrations *(85)		Practice group demonstrations *(86)		Example 35 minute lesson (87)		Guided preparation for first 35 minute practice lesson (88)
Wednesday	Guided preparation for first 35 minute lesson (89)		Practice 35 minute lesson *(90)		Practice 35 minute lesson *(91)		Practice 35 minute lesson *(92)		Practice 35 minute lesson *(93)		Practice 35 minute lesson *(94)		Practice 35 minute lesson *(95)		Guided preparation for second 35 minute practice lesson (96)
Thursday	Guided preparation for second 35 minute lesson (97)		Practice 35 minute lesson *(98)		Practice 35 minute lesson *(99)		Practice 35 minute lesson *(100)		Practice 35 minute lesson *(101)		Practice 35 minute lesson *(102)		Practice 35 minute lesson *(103)		Revision and discussion on the lesson technique (104)
Friday	Films, film strips and episcope (105)		Film (106)		Hints to instructors on the showing of films (107)		General discussion on training problems (108)		General revision (109)		Farewell address (attended by representative of Board) (110)				

*Class divides with groups operating simultaneously

APPENDIX 4 See Page 3

D.E.P. MODIFIED ONE-WEEK COURSE

Instructional Techniques for Industrial Instructors

Timetable for six Instructors

Each Class member will undertake the following practices in the sequence shown:—

(1) 1st Practical Workshop Demonstration — 5 minutes
(2) Trade Talk or Lecturette — 15 minutes
(3) 2nd Practical Workshop Demonstration — 5 minutes
(4) 1st Group Demonstration — 10 minutes (approx.)
(5) 2nd Group Demonstration — 10 minutes (approx.)

	8.30 a.m. 9.15 a.m.	9.20 a.m. 10.05 a.m.		10.15 a.m. 11.00 a.m.	11.05 a.m. 11.50 a.m.	11.55 a.m. 12.40 p.m.		1.40 p.m. 2.25 p.m.	2.30 p.m. 3.15 p.m.		3.30 p.m. 4.15 p.m.
Monday			COFFEE BREAK				LUNCH BREAK		Outline of Course: The Role of the Industrial Instructor	TEA BREAK	Why and How People Learn
Tuesday	Individual Instruction in the Workshop			Example Demonstration	Guided Preparation for 1st Practice Demonstrations	1st Practice Demonstrations (2 members per session)		1st Practice Demonstrations	1st Practice Demonstrations		The Lecture
Wednesday	The Blackboard and other Visual Aids			Example Trade Talk or Lecturette	Guided Preparation for Practice Trade Talks	Practice Trade Talks (2 members per session)		Practice Trade Talks	Practice Trade Talks		Guided Preparation for 2nd Practice Demonstrations
Thursday	2nd Practice Demonstrations	2nd Practice Demonstrations		2nd Practice Demonstrations	Group Instruction in the Workshop			Example Demonstration	Guided Preparation for 1st Practice Group Demonstrations		1st Practice Group Demonstrations
Friday	1st Practice Group Demonstrations	1st Practice Group Demonstrations		Guided Preparation for 2nd Practice Group Demonstrations	2nd Practice Group Demonstrations	2nd Practice Group Demonstrations		2nd Practice Group Demonstrations	General Revision and Discussion		

Timetable for eight Instructors

Each Class member will undertake the following practices in the sequence shown:—

(1) Practical Workshop Demonstration — 5 minutes
(2) Trade Talk or Lecturette — 15 minutes
(3) 1st Group Demonstration — 10 minutes (approx.)
(4) 2nd Group Demonstration — 10 minutes (approx.)

	8.30 a.m. 9.15 a.m.	9.20 a.m. 10.05 a.m.	COFFEE BREAK	10.15 a.m. 11.00 a.m.	11.05 a.m. 11.50 a.m.	11.55 a.m. 12.40 p.m.	LUNCH BREAK	1.40 p.m. 2.25 p.m.	2.30 p.m. 3.15 p.m.	TEA BREAK	3.30 p.m. 4.15 p.m.
Monday									Outline of Course: The Role of the Industrial Instructor		Why and How People Learn
Tuesday	Individual Instruction in the Workshop			Example Demonstration	Guided Preparation for 1st Practice Demonstrations	1st Practice Demonstrations (2 members per session)		1st Practice Demonstrations	1st Practice Demonstrations		1st Practice Demonstration
Wednesday	The Blackboard and other Visual Aids			The Lecture	Example Trade Talk or Lecturette	Guided Preparation For Practice Trade Talks		Practice Trade Talks (2 members per session)	Practice Trade Talks		Practice Trade Talks
Thursday	Practice Trade Talks	Group Instruction in the Workshop		Group Instruction in the Workshop (*contd.*)	Example Demonstration	Guided Preparation for Practice Group Demonstrations		Practice Group Demonstrations (2 members) per session)	Practice Group Demonstrations		Practice Group Demonstrations
Friday	Practice Group Demonstrations	Guided Preparation for 2nd Practice Group Demonstrations		2nd Practice Group Demonstrations	2nd Practice Group Demonstrations	2nd Practice Group Demonstrations		2nd Practice Group Demonstrations	General Revision and Discussion		

INSTRUCTOR TRAINING

Two-weeks Basic Course for Wool, Jute and Flax Industry

(16 students per Course with 2 tutors)

First Week

Day	9.00—10.00	10.00—11.00	11.00—12.00	12.00—13.00	14.00—15.00	15.00—16.00	16.00—17.00
1	Introduction. Industrial Training Act. Organisation of training, Responsibility of Instructor	Why People Work and How People Learn. Communication and Barriers to Learning	Induction Training followed by film "A Chance to Learn"		Need to train Operators	Introduction to Job Breakdown	Film "Hazard"
2	Job Breakdown – Practice Collectively and in Syndicates			Introduction to Four Step Method	Demonstration of Four Step Method	"How to Instruct" Practice	
3	"How to Instruct" Practice						
4	Quality and Faults Analysis	Progress Reports and Training Records	Interpretation of Training Schemes	Job Breakdown Practice	Job Breakdown Individual Practice		
5	Job Breakdown Individual Practice						Film "Operator Training"

Second Week

6	Review of First Week	Planning a Training Programme		"How to Instruct" Practice			Film: "Pattern for Instruction"
7	Project Work on Textile Tasks						
8	Project Work on Textile Tasks						
9	Project Work on Textile Tasks involving preparation of Job Breakdown and Instruction						
10	Review of Project Work		Explanation of ITB Training Recommendations			Review of Course	

APPENDIX 6
See Page 4

Instructor Training Courses run by the Industrial Training Service

The Industrial Training Service provides assistance with the development of training of all kinds to industrial training boards, employers' organisations, and individual companies, including the setting-up of training schemes within companies and the training of instructors for these schemes. These instructor courses are designed to meet specific requirements. These may cater for instructors covering a particular field of training in a particular industry e.g. the glass industry, a specialist field in a particular company e.g. fork lift truck driver instructors, or specific instruction in a general field e.g. operator training in a number of departments in a company. Such training schemes form by far the bulk of the training of instructors carried out by the I.T.S.

In addition to these courses, the Industrial Training Service has run three courses on "Practical Training Techniques" each year, to meet the needs of industry generally. The dates and times of each course were circulated through the D.E.P. Regional Offices, and application for vacancies are received from individual companies and organisations. Courses of this type are now provided as required to meet the needs of specific companies and organisations.

The "Practical Training Techniques" courses are devoted to items which are considered to be the knowledge and skills required by every instructor and, because of the limited time available, to basic essentials. Emphasis is placed on developing the practical ability of each course member to impart knowledge by means of a classroom lesson (Theoretical Instruction Session) and to impart skill (or the ability to do something) by means of practical lessons, and individual instruction or coaching.

In all the Service's instructor training, considerable emphasis is placed on developing the ability of potential instructors to analyse jobs in terms of the knowledge content and practical ability required to do the job, and in determining trainees' difficulties in learning practical skills. Skill in analytical work is developed through practical work in the training area, on the shop floor, and in analysing jobs in their own particular company. For this purpose, the general courses on practical training techniques are split into two separate weekly periods, separated by a period of one or two weeks, during which members of the course carry out project work in their own companies. The discussions which take place in the second week are based on the project work.

Since the emphasis of the general course is placed on developing the practical ability of course members, the time devoted to training in many other aspects of an instructor's duties is inevitably limited. It is recognised that further help and guidance must be given to instructors when they return to their companies. This guidance is available either through the consultancy work of the I.T.S. or specialist company training staff, where the instructor can become an effective member of the training team.

A synopsis of the course syllabus of the general course and a specimen of an in-company course for instructors of Fork Lift Truck Drivers is given on the following pages.

Industrial Training Service
Two-Week Sandwich Course for Instructors
"Practical Training Techniques"

First Week	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9.00–10.00		The Nature of Industrial Skills	How and Why People Learn	Basic Techniques: Showing	Analysis – Report and discussion of job breakdowns for selected jobs in the local factory
10.00 10.45		Analysis of Jobs – Stage I Breakdown of Job to Main Operations	Introduction to Instructional Methods and Techniques	Preparation for Practice Demonstrations	
11.00–12.00		Analysis of Jobs – Stage II Breakdown of Operations to Elements	Basic Techniques: Telling	Basic Techniques: Showing – Practice Demonstrations	Instructional Methods – Planning an Instructional Session
12.00–12.45		Analysis – Briefing for visit to local factory	Preparation for Practice – Short Talks	Basic Techniques: Showing – Practice Demonstrations	Briefing for Individual Projects in Week 2
2.00–3.00	Course Assembles	Visit to Local Factory Project to Analyse Selected Jobs in the Factory and prepare Breakdowns	Basic Techniques: Illustration (Use of Blackboard, etc.)	Basic Techniques: Showing – Practice Demonstrations	Course Disperses
3.00–3.45	Welcome and Course Arrangements		Basic Techniques: Telling – Practice Short Talks	Basic Techniques: Showing – Practice Demonstrations	
4.00–5.00	Mutual Introductions		Basic Techniques: Telling – Practice Short Talks	Basic Techniques: Showing – Practice Demonstrations	
5.00–5.45	The Industrial Training Act		Basic Techniques: Telling – Practice Short Talks	Film and Discussion "The New Instructor"	
Evening		Project and Discussion	Film and Discussion "Operator Training"	Project work	

Each course member will be required to give one practice short talk and one practice demonstration during Week I and will take part in a job analysis project, working in syndicate.

During the period between the two weeks of the course, each member will be required to prepare a practical lesson on some simple skill employed in a job in his own factory, and a classroom lesson on some piece of knowledge needed in the same or a different job.

"Practical Training Techniques" (*Continued*)

Second Week	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9.00–10.00		Instructional Methods – Practice Instructional Sessions	Instructional Methods – Targets and Stamina Building	Instructional Methods – Practice Instructional Sessions	Discussion of Members Programmes
10.00–10.45		ditto	Introduction to Programme Planning	ditto	ditto
11.00–12.00		ditto	Programme Planning Practical Examples	ditto	ditto
12.00–12.45		ditto	ditto	ditto	Recapitulation and Summing-up
2.00–3.00	Course Assembles	ditto	Measuring Trainees Progress – Records and Reports	ditto	Course Disperses
3.00–3.45	Instructional Methods The Classroom Lesson	ditto	Instructional Methods Group Discussion Leading	ditto	
4.00–5.00	Instructional Methods The Practical Lesson	ditto	Practice Discussion	ditto	
5.00–5.45	Instructional Methods The Use of Exercises	Film "Illustration" at 5.00 p.m.	ditto	ditto	
Evening		Project Work	Project Work		

Each course member will be asked to give one practice Classroom Lesson (20–25 min.) and one practice Practical Lesson (20–25 min.). Course members will also be asked to conduct a short Group Discussion.

In—Company Course for Instructors of Fork Lift Truck Drivers

(4 Trainee Instructors)

Day	09.00–09.45	09.45–10.30	10.45–11.30	11.30–12.30	2.00–2.45	2.45–3.30	3.45–4.30	4.30–5.15
Monday	Introduction to Course Mutual introductions Industrial Training Act		The Nature of Industrial Skills	Job Analysis Stage I	Job Analysis Stage II	Practical Analysis Work Stage I – Fork Lift Truck Drivers		Preparation for Practice Short Talks
Tuesday	How and Why People Learn	Introduction to Instructional Methods	Practical Analysis Stage II – Fork Lift Truck Drivers		Basic Techniques Telling	Practice Short Talks		Illustration – Film
Wednesday	Basic Techniques – Showing	Preparation for Practice	Practice Short Demonstration	Planning Instruction	Instruction Methods Classroom Lessons	Preparation for Practice Instructional Sessions		
Thursday	Practice Instructional Sessions			Use of Exercises	Targets Stamina Build-up	Preparation for Practice Demonstrations		
Friday	Measuring Trainee's Progress	Practice Demonstrations			Recapitulation and Summary	Preparation for Detailed Analysis Work on Fork Lift Trucks		

The above programme was followed by a further week of preparation, during which the potential instructors prepared and gave practice talks and demonstrations to each other, each preparing different parts of the syllabus to be covered. This was done under the guidance of an I.T.S. Training Development Officer, who also developed the programme of training. After the preparation, a pilot course for trainees was run, the I.T.S. officer guiding the instructors in their work. This was followed by a second course, under less guidance, and the future conduct of the training then became the responsibility of the company training officer.

APPENDIX 7 See page 11

OPERATOR-INSTRUCTORS' COURSE

Example Syllabus of In-Plant Two Weeks Course

(for a maximum of 8 selected operator-instructors)

First week	Period 1		Period 2	Period 3	Period 4
Monday	Objectives of the Course	The need for induction and training of operators	How training is planned (includes an exercise)	How people learn. (The use in jobs of movements, senses, decisions and automatic reactions)	Barriers to learning. The comparison of effective learning times
Tuesday	Methods and rhythm in productive jobs		Dividing jobs into units (with exercises)	Shop floor practice in syndicates and/or pairs in dividing jobs into units of instruction	
Wednesday	Analysis of jobs (*a*) shop knowledge		Analysis (*b*) job knowledge	Shop floor practice in syndicates and/or pairs in analysing (*a*) shop knowledge (*b*) job knowledge	
Thursday	Discussion on previous practice on shop and job knowledge		The analysis of skill Elements/movements, use of senses, decisions and automatic reaction	Demonstrations of analysing skill (by Training Officer)	Group room exercises in analysing skill
Friday	Shop floor practice in analysing skills. Syndicates, pairs and individual efforts				

It is expected that a firm's trainer would, some time prior to the course, have initiated management and supervisors into the need and the gist of the operator-instructor course, covering selection method and the training plan.
Each operator-instructor would provide one unit of a job for practice in analysing during the 3rd and 5th days.

Second Week	Period 1	Period 2	Period 3	Period 4
Monday	Recapitulation on analysing skills (9–9.30)	Preparing instruction breakdowns from analyses (demonstrations and exercises)	Shop floor practice in preparing breakdowns from analyses	(4–4.45) How instruction breakdowns are used when instructing
Tuesday	Quality specifications and the faults analysis with exercises	How instruction is given. (Demonstrations by Training Officer)	Group room exercises in giving instruction	The synthesis of instruction
Wednesday	The use of special exercises and target times	Shop floor practice in giving systematic instruction from prepared instruction breakdowns (syndicates and pairs)		
Thursday	Pairs practice in preparing and giving instruction practice to include shop knowledge, job knowledge, analysis, instruction breakdown, faults analysis, target times and presentation to a learner. (Two jobs completed in each pair. One job per operator-instructor. Training Officer to give individual coaching)			
Friday	Discussion and correction as a result of shop practice in previous day	Maintaining progress records	*Managers and Supervisors join in.* Meeting to discuss training plans	Trainees prepare for instruction at own workplace

APPENDIX 8 See page 11

OPERATOR-INSTRUCTOR COURSE

Example Syllabus of Out of Plant Two Weeks Course

Periods	1	2		3	4		5	6		7	8
DAY 1	QR Start of course. Mutual introductions and general arrangements	QR Film: (introduce subject) "A Pattern for Instruction". Discuss some features	15 minute break	QR Aims of course. Role of instructor. Use of senses in learning	QR The "whole job". Features job description, working instructions, correct method	1¼ hour lunch break	WS Examine a job in workshop. Discuss divisions into "units"	QR Practical work. Study own job–any prepared material	15 minute break	QR Preparation of material for instructional manual	QR Revise day's work. Prepare for day 2
DAY 2	QR Revision 10 min. Introduction "Analysis of skills". Isolate difficulties. Job type A	QR Make analysis together – Job type A Handout		QR Individual Practice. Job type B	QR Practice in pairs. Each makes analysis Job Type A and B		WS Examine Job types B and C. Group for analysis	WS Practical work in pairs. Analysis Job type D		WS Job type E	QR Revise day's work. Add to manual
DAY 3	QR Revision 20 minutes. Discuss relation between Job types F and G. Introduce "Working Instructions"	QR Practical work in pairs. Summary of information Job type G/H		QR Demonstrate "informing"	QR Practical work in pairs. Demonstration of "informing" Preparing sheets for manual		WS Collective practice analysis. Job type C Discuss other applications	WS Practical work in pairs. Prepare two analyses. Jop type I and J		WS Continue practical exercise	QR Discuss analysis of skills. Illustrate from Job Type D

Job types specified above are listed on page 63. QR=Quiet room WS=Workshop

Briefing of managers and supervisors of the objects of the course should be done before the course starts. Operators selected for training should be briefed before the course, and special instruction given to their supervisors on the need to follow up the training by coaching the trainee.

Periods	1	2		3	4		5	6		7	8
DAY 4	QR Introduce standards of work. Quality measuring, visual and other senses, instruments, faults. Handout	QR Practical work in quality measuring	15 minute break	QR How to prepare an Instruction Session	QR Preparation of Practice Session	1¼ hour lunch break	QR In front of the others when ready Practice Session All trainees have a practice	QR	15 minute break	QR Develop Job C using visual aids and exercises if practicable	QR Try out on a learner
DAY 5	QR Introduce "barriers to learning". Discuss methods to overcome	QR Demonstrate "preparation of learner" and "follow up"		QR Practice in pairs the whole of 4 step method of instructing	QR Two individual practices		WS Individual Practices in Workshop with learners			QR Introduce discussion "learning environment"	QR Show part of film "A Pattern for Instruction". Discuss and recapitulate
DAY 6	QR Revision of previous week's work. Introduce "development of skill"	QR Company training plans, syllabus etc. Records		QR Company arrangements for induction and safety	QR Completion of manual. Fault analysis. Discuss methods for use		Visit to a company training department				QR Final questions and problems. Make arrangements for visits (Coaching and revision)
DAYS 7, 8, 9 and 10	Coaching on the job										

Notes: Theory amounts to 17½ hours
Practical work amounts to 18 hours

Example of Out of Plant Two-week Course for Operator-Instructors

Types of job to be used for demonstrations and practical work

(This list to be used in conjunction with the time-table on pages 61 & 62)

A Straightforward uncomplicated assembly or sub-assembly of part or a whole component.

B Use of power tool or hand tool.

C Starting and stopping a machine.

D Part of a cyclic operation or similar long process.

E A complex key point involving a mechanism and material which has to be tensioned e.g. use of knotter in textiles.

F Setting up a piece of work where sequence and arrangement is important.

G Explanation of a working instruction to a trainee e.g. special information, use of conversion table, safety precaution, particular standard, plant services, identification of plant services such as water, air, steam, colour coding.

H Explanation of machine safety rules as introduction to working a machine.

I A cleaning operation, domestic, chemical or other.

J Handling a load or pallet or similar job. Manual lifting techniques where whole body involved. Stacking finished work.

APPENDIX 9 See page 11

OPERATOR-INSTRUCTORS' COURSE

Example Syllabus of In-Plant Six-Day Course

Adapted for production line – "on the track" – limited skill jobs

40 minutes each period with 5 minutes between	PERIOD 1	PERIOD 2	PERIOD 3	PERIOD 4		PERIOD 5	PERIOD 6	PERIOD 7	PERIOD 8
DAY 1	**Introduction by Management** Mutual introductions. Explanation of course Role of Operator-Instructor	**How Instruction is Prepared** Job breakdowns Skills analysis Fault analysis	Examination of workshop tasks for units of instruction	Study of own work to identify units	Lunch break	**Preparations of Job Breakdowns** Guided exercise	Practice	Practice	Coaching and revision
DAY 2	**Principles of Learning** Use of senses, Motivation. Feed back	Planned approach. Use of Breakdowns. Isolation of different skills	**Practice of Instruction** Demonstration by Leader	Preparation of members' own demonstrations		Practice demonstrations by members in pairs with guidance and coaching			Revision
DAY 3	**Standards of Work** Quality. Quantity Safety	**Purpose of Explanation in Instruction** Points to use in a short talk	Preparation of notes for talk – use of visual aids	Practice exercise in pairs		**Practice in Explaining Job Knowledge, etc.** Practice talks. Use of visual aids. Each student – one practice, with guidance and comment from others		Introduce Programmed Instruction as possible alternative Demonstration	Revision

40 minutes each period with 5 minutes between	PERIOD 1	PERIOD 2	PERIOD 3	PERIOD 4		PERIOD 5	PERIOD 6	PERIOD 7	PERIOD 8
DAY 4	**Consolidation** Use of breakdowns for practical work and notes for talks	**Record-keeping** Work Sheets. (Training trainees in use)	**Training Records** Explanation and discussion	**The Workplace** Preparation for instruction. Revise "Standards of work"	Lunch break	**The Complete Exercise of Instructing** Preparation of material for practical work, short explanation, preparation of workplace etc. under guidance with demonstrations in pairs			**Film** "A pattern for instruction"
DAY 5	**Induction of New People to Department** Discuss needs especially Safety standards	**Quality of Work** Discuss "Standards", tests, fault diagnosis, examples etc. and action needed	Practice involving fault example. How and When to use	**Preparation for Shop Floor Practice** Guide on all points covered		**Practical Instructing on Shop Floor** Live situations – Leader to observe			Revision
DAY 6	**Practical Instructing on Shop Floor** As on previous afternoon – Leader to coach as appropriate					Discuss the next step. Plans for follow up	**Closing Talk** Review course, invite questions. Discuss with Management		

Length of course 31 hours (Theory 12½, Practical Work, 16, Revision 2½)

OPERATOR-INSTRUCTOR COURSE

Example Content of One Week Course Out of Plant

Refresher Training in Job Analysis and Job Instruction

Day	PERIOD 1	PERIOD 2	PERIOD 3	PERIOD 4	PERIOD 5	PERIOD 6	PERIOD 7
1	Reception and Introduction. Organisation of training. Role of Instructor. Why People Work and How People Learn	How to instruct (Theory and Demonstration)		Accident Prevention	Introduction to Job Breakdown	Collective Practice in making a Job Breakdown	
2	Recapitulation	Individual practice in Job Breakdown			Film "Pattern for Instruction"	How to instruct	
3	Recapitulation	Planning training programmes, use of manuals, training records	Practice instruction using breakdowns (In syndicates followed by appraisals)				
4	Recapitulation	Individual practice in Job Breakdown		Practice Instruction in syndicates			
5	Recapitulation	Practice instruction in syndicates				Summary and Review of course	

APPENDIX 11 See page 16

OPERATOR-INSTRUCTOR TRAINING

Example One-Day Briefing Session for Senior Management

(Department Heads, Superintendents and above)

	PERIOD 1	PERIOD 2	PERIOD 3	PERIOD 4
Morning Session	Management's Responsibility for Training The Current need Using Operators as Instructors Management support needed by Operator-Instructors	Selection of Operator Instructors How Operator-Instructors will be trained to Instruct – objectives – means	Planning Training in a Department The Induction of new entrants – to company – to shop	The aims of Instruction. How and Why people learn The Use of the senses in learning – the use of Training aids
	PERIOD 5	PERIOD 6	PERIOD 7	REMARKS AND NOTES
Afternoon Session	Demonstrations of:— The preparation of Instruction - Analysis of skills Development of Instruction breakdowns	Demonstrations of:— The presentation of Instruction:— Practical Verbal The use of special exercises	The faults analysis The synthesis of instructions. Target times Training Records:— Samples Discussion	

APPENDIX 12 See page 16

OPERATOR-INSTRUCTOR TRAINING

Example One Day Information Course for immediate Supervisors of Operator-Instructors

	PERIOD 1	PERIOD 2	PERIOD 3	PERIOD 4
Morning Sessions	The need for operator-training The objectives of operator-instructor course The utilisation of operator-instructors using a Department Training Plan	The selection of operator-instructors	The aims of instruction. How and why people learn Demonstration of: How instruction is prepared – analysing skills and preparing instruction breakdowns	Information required by operator-instructor from Supervisor, for example: work methods safety rules quality specifications time factors availability of equipment training aids details for faults analysis
	PERIOD 5	PERIOD 6	PERIOD 7	
Afternoon Sessions	The presentation of instruction: Demonstration of: The approach The method The synthesis Target times Discussion on special exercises	Information and help required by operator-instructor from Supervisor: Interest points Sequence of units Exercises possible Frequency of instruction	Initiations by Supervisors: Short talks to trainees Provision of relevant documents e.g. written instructions, handbooks Devising of appropriate records Follow-up of operator-instructors Certification and tests of operator-instructors and trainees Evaluation of Department training scheme	

APPENDIX 13 See page 22

EXAMPLE PROGRAMME OF JOB INSTRUCTION TRAINING ON CONTINUOUS PROCESS

Day	*D—14*		*D—7*		*D*	*D+1*	*D+2*	*D+3*	*D+4 or more days*	*D+5 or later*
Persons Involved	Manager. Senior-Supervisor. Junior Supervisor. Training Officer. TWI Trainer		Manager. Supervisors and Junior supervisors concerned. Training Officer. TWI Trainer		Operator-Instructor. Training Officer. TWI Trainer	Operator-Instructor. Coaching TWI Trainer	Operator-Instructor. Coaching TWI Trainer	Operator-Instructor. Foreman. TWI Trainer	Operator-Instructor. Trainee. Coaching TWI Trainer	Operator-Instructor. Trainee. Foreman. TWI Trainer, Manager
Location	Lecture Room. Manager's Office. Visit Plant		Office. Training Bay. Visit Shop Floor		Lecture Room. Training Bay.	Shop Floor	Shop Floor	Foreman's Office and Shop Floor	Shop Floor	Shop Floor and Manager's Office
Action	Job Instruction Appreciation. Fault Sheet Select jobs Check Job Descriptions available Union Consultation Approach Operator-Instructor		Examination of Training needs from Job Description. (a) Eliminate already known. (b) Settle off-the-job skills. (c) Settle off-the-job knowledge. (d) Test what remains Estimated Training Times Plan Training Programme		Discuss Training Programme Analysing Job Shop Floor Practice Method of Instruction	Preparing Analysis of tasks and Instructional Breakdown		Checking Breakdowns for (a) Correct Practice. (b) Instructional Soundness	Instruction of Trainee	Checking Training satisfactory Review of Training Progress with Manager